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## Original Articles

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### PRESIDENT'S ADDRESS

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PACIFIC COAST SOCIETY OF ORTHODONTISTS

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WILL G. SHEFFER, SAN JOSE, CALIF.

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WHEN we look at the pages in our program devoted to Past Presidents and Dates of Meetings, we must realize that much thought, time, and effort have been spent contributing to the progress of orthodontics since the Pacific Coast Society of Orthodontists was organized in 1913.

Twenty-eight years is but a short period of time compared to the 2,000 years that orthodontics has been practiced. We look with gratitude and esteem to the pioneers in orthodontics even before it became a specialty, realizing that it is now a great privilege to carry on the good work that was started many years ago. The progress in our specialty in the last twenty-eight years was made possible because the early workers in orthodontics on the Pacific coast used initiative and foresight in laying the foundation for the organization of our Society. Each officer since then with his corps of workers has striven to hold the organization together and to present programs that exemplified the latest and best in orthodontics and has guided the destiny of this Society until now it is rightfully a constituent of the American Association of Orthodontics.

Much fitting into the parent Association has occurred since our last meeting. Modification of the Constitution and By-Laws to more closely conform with those of the parent organization are being made so that the Society will function even more smoothly. The Constitution and By-Laws Committee has worked diligently in preparation of these changes to be presented to you during this meeting. The increased responsibility that is now ours is accompanied by a sense of security as we become more unified in purpose with the other components of the parent Association.

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Read before the Nineteenth General Meeting, San Francisco, Calif.. Feb. 20 to 22, 1941.

With so much already having been accomplished to make orthodontics a well-organized specialty, we must remember that part of the object of our organization is "to contribute its part in dental health service." As we become more and more engrossed in the intricacies of new techniques and in securing additional diagnostic data, we are apt to neglect continuing and developing the very lifeline of our professional existence, namely, making the public want orthodontic treatment. The mere occasional distribution of public-relation bulletin materials is not enough to make parents desire orthodontic treatment for their children more than they do new cars, additional electric household aids, or series of beauty treatments. It is every orthodontist's duty to spread the gospel of orthodontics to the dentists, physicians, and people of his community.

Just recently an orthodontist told me he was advising his son not to take up orthodontics because the field was already too crowded. The addition of many more specialists to our ranks makes it all the more advisable that the older men, those with more mature viewpoints, take up their share of the task of creating a market for orthodontics. But this much needed endeavor is self-limiting. When more time is spent in the preparation and presentation of talks to the public, with accompanying influx of new patients as an indirect result, less time per day is left to perform those necessary duties which produce the results for which the parents pay.

We are still treating less than 2 per cent of those in need of orthodontic treatment. If we are to raise that percentage of children receiving the benefits of orthodontic treatment, we must either increase the number of orthodontists, reach more people with our health-through-orthodontics approach, or so present the deformity and the benefits to be derived from treatment that the patient and parent will want treatment regardless of the cost. Many methods of investigation are at our disposal when we seriously attempt a scientific diagnosis of a dentofacial deformity. The benefit to the orthodontist derived therefrom is in direct proportion to the extent an investigation is utilized. But to the patient, models, charts, photographs, and x-ray pictures can become visual aids in describing the extent and seriousness of the deformity.

Little is taught our students in orthodontics about the benefits a patient derives from orthodontic treatment. Likewise little is taught the student about presenting orthodontics to the public or to the parent to create a desire for orthodontic treatment. When such subjects are taught, more people will want orthodontic treatment for their children. It was with the genuine approval of teachers of orthodontics that a course in psychology of teaching dental subjects was offered to dental teachers by the University of California. We too must raise the standard of our approach to the public if our profession is to progress.

The distribution of orthodontic literature to public health workers brings immediate response in the form of new patients unable to pay for orthodontic services. One orthodontist recently remarked, "I can't take care of so many patients who want treatment for nothing." The regimentation of these indigent patients into groups sponsored by county or state aid, such as those groups

receiving treatment under California's Crippled Children's Act, has not brought much additional orthodontic treatment to the handicapped children of the Pacific coast. Instead, bargaining for cheaper orthodontic fees between communities and an attempt to secure treatment at a lower fixed-fee basis, no matter how extreme the deformity, has become a splendid illustration of what can be expected if orthodontic treatment of dentofacial deformities is regimented and controlled by those not conversant with the difficulties involved in the orthodontic treatment of handicapped indigents. Four years ago resolutions were passed by this Society recommending a minimum fee per year schedule for the treatment of such indigents. Several communities in California have been abiding by this resolution to the satisfaction of all concerned. When reminded of this minimum fee per year resolution, one of our own members replied, "Try and get it." He thereby not only relinquished his democratic professional right to estimate his fees in his own office but invited, by his act, the continuance of brow-beating, price-bargaining tactics in his own community and throughout the entire coastal district. One has but to attempt correction of a few of these extremely handicapped indigents (and they are not certificated unless they are extreme) to realize that, while the fees are cut off abruptly at the termination of the fixed-fee basis, or even when the patient arrives at an age limit, yet the patient continues to report for treatment sometimes for years thereafter without ever so much as a thank-you given to the orthodontist.

Unfortunately war-time mass production cannot be applied to orthodontic treatment because children respond to the appliances only as fast as they are able to grow bone. Even though there is a limit to the number of patients an orthodontist can adequately treat and a very definite limit to the number of charity patients he can treat, we nevertheless must keep on with our public relations work. Orthodontic treatment might be compared to a college education. We know everyone cannot have a college education, yet we keep on urging everyone to secure it if possible. But unlike education, a little orthodontics, say ten or fifty dollars' worth, as one charity worker recently requested, is hardly the solution to making public monies go further in orthodontics.

The members of each section of our Society are considerate of needy patients and are upholding the highest standards of orthodontics. Over one-third of the members of the American Association of Orthodontists have gone before the American Board of Orthodontics for examination and certification. It is with pride that we note that many of our Pacific Coast members have qualified for certification by this Board which is promoting higher standards in orthodontics. It is a pleasure to attend the Section meetings. The Northern Section is to be complimented for having unique, all day and evening meetings with essays and clinics including activities of different study groups. The Southern Section, in addition to having interesting and educational essays and clinics, has meetings more frequently than four times a year. The commendable routine of electing to the office of secretary the member who has attained his seniority by his attendance and by participation in the programs has added deserved dignity to the office. The Central Section has enjoyed essays and clinics given by members of the other sections and has diligently sought program

material for the biennial meetings. It looks forward with pleasure to each general meeting customarily held in its district. The good will and fellowship of our members and the wealth of splendid programs at our disposal warrant our Society's having annual meetings.

I take this opportunity to thank the essayists and clinicians for their willingness to appear on our program. My sincere thanks go also to the officers and committee members who have worked so diligently the past two years and to the members who have served on committees of the American Association of Orthodontists thereby keeping our Society a progressive constituent of the parent Association.

It is with sincerity that I express appreciation for having had the privilege and honor of being your president for the past two years. The splendid cooperation you have given me and the priceless comradeship and friendliness of the entire membership has made my term of office a particularly happy one. We are assured of a smooth functioning meeting because no detail has been overlooked by our most efficient Local Arrangements Committee. The Program Committee has worked long and hard to prepare a splendid program replete with education material that will aid all of us to practice better orthodontics in our respective communities.

The educational opportunities on the Pacific coast for the study of orthodontics are great. The individual personnel of our membership and the Society itself is upholding the highest type of professional standards. Let us strive to maintain these standards.



## RECORDING DENTAL ANOMALIES FOR CLINICAL APPRAISAL

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**A**N INCREASING number of experienced orthodontists feel that the problem of orthodontic diagnosis deserves far more consideration than it usually receives, for, to meet it adequately, the clinician must place himself in a position to determine the true character of anomalies, their extent, and the various conjoining parts involved. Only when such facts are adequately visualized can a logical treatment policy be planned.

No perfect method of diagnosis has yet been developed. Human judgment, rarely infallible, must, of necessity, be called upon to interpret our cases, and it is, therefore, of vital importance that we approach the question supplied with every helpful means which will sharpen our powers of observation. In an effort to reduce the problem to the most practical form for everyday use, four prerequisites will be discussed; they are (1) the consultation and written record; (2) the roentgenographic record; (3) the oral and denture record; (4) the facial record.

*The Consultation and Written Record.*—In the discussion of the first named prerequisite, the importance of that professional contact with patients, which we designate as the consultation, assumes major importance. On this occasion a written record should be made containing such relevant facts as the age of the patient, the form and relationship of the dental arches as revealed by intraoral observation, the teeth and oral forms of the father and mother, the condition of the soft tissues, the incidence of caries, the number of teeth, whether normal, deficient, or redundant, the presence of nonvital teeth, the status of tongue size, whether normal or abnormal, the patient's general health, observations of the nose, the lips, the facial muscles, and whether these last-mentioned organs approach normal form and function or show deficiencies.

In addition to the above, possible etiological factors should be recorded, not only as a safeguard during treatment, if it be undertaken, but as a means of accumulating facts which, in time, will be valuable in proving or disproving their bearing as causative factors. All this useful information may be recorded upon a suitable record card by merely checking the items named, or briefly writing in such additions as seem pertinent. It is also possible to indicate a tentative prognosis and such recommendations as the consultation justifies. As all cases are not treated, and as practitioners are frequently misquoted by patients, a permanent record of these findings may prove a safeguard of real satisfaction.

*The Roentgenographic Record.*—As the orthodontist is concerned with the growth of the dentofacial area, during the period when the development and eruption of teeth play so important a part, a roentgenographic examination should be a routine part of every diagnostic effort. In addition to this routine

Read at the Twentieth Annual Meeting of the Southwestern Society of Orthodontists, Feb. 3, 1941.

procedure, a supplementary method of recording dentofacial relations is available through the use of cephalometric roentgenograms. These are full lateral head reproductions and show the orientation of the denture to the other facial osseous structures, and also the dependent relationship of the soft tissues. During any period of treatment a sequence of such records supplements information revealed by our denture and facial reproductions, in that important osseous changes, accompanying or resulting from treatment, can be made evident (Fig. 1).\*

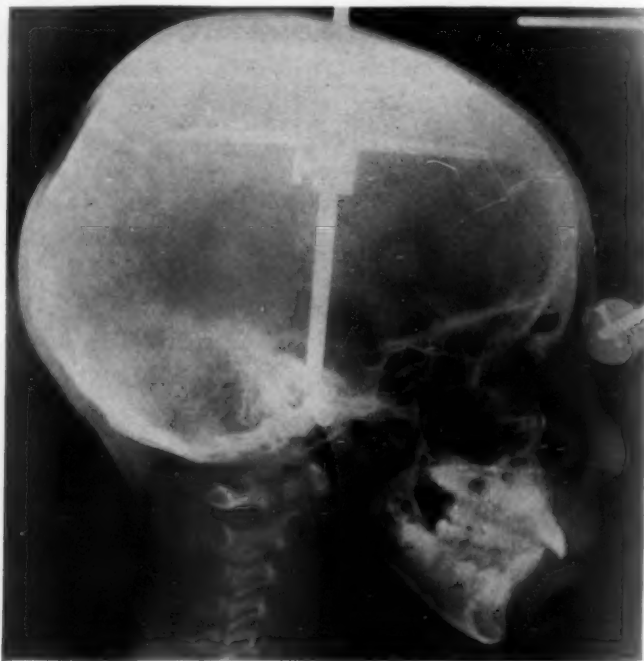


Fig. 1.—A cephalometric roentgenogram showing the orientation of the denture to the other facial osseous structures, and also the dependent relationship of the soft tissues.

*The Oral and Denture Record.*—The necessity for accurate denture reproductions has always been considered indispensable, where an anomaly is to receive diagnostic consideration. These should furnish definite information as to the character and extent of abnormality present in the denture and its immediate underlying bony structures. If properly constructed, these will reveal such information, and, when combined with suitable facial records, the orientation of the denture to its dependent structures in the face is also shown. That the ordinary plaster casts used in the past have failed to fulfill such requirements will become apparent to anyone who will compare this old type to those obtained with the aid of the gnathostatic methods given us by Professor Simon. These not only record every dental detail but also show dentocranial relations. The principles involved are shown in Fig. 2. Inasmuch as the top of the base of the maxillary denture reproduction represents the Frankfort horizontal plane, and the base of the mandibular cast is made parallel to it, plus the fact that the median and transverse orbital planes are marked on them during their

\*Figs. 1, 2, 3, 5, and 6 are taken from McCoy: *Applied Orthodontics*, ed. 5, Philadelphia, 1941, Lea & Febiger, and are used with the publisher's permission.

preparation, the ability to visualize existing deviations in the three dimensions of height, width, and length is made possible.

In addition to revealing the actual position of the denture in the face, such casts show conditions not ordinarily discernible in the old type of record models, such as the angle of the occlusal plane, asymmetrical growth manifestations affecting the denture, both vertically and horizontally, and *the actual angle of inclination of the teeth*, all of which are essential if our best judgment is to be utilized.

No attempt will be made here to describe in full detail the sundry steps necessary in their construction, other than to state that accurate impressions made by any one of several satisfactory methods are, of course, essential. Through the use of the gnathostatic face-bow, at the time the upper impression is taken, followed by other equally simple and accurate pieces of apparatus, the casts are completed and marked with the measuring planes already mentioned, the whole process requiring less time and effort than are essential in making the old-fashioned "unrelated casts."

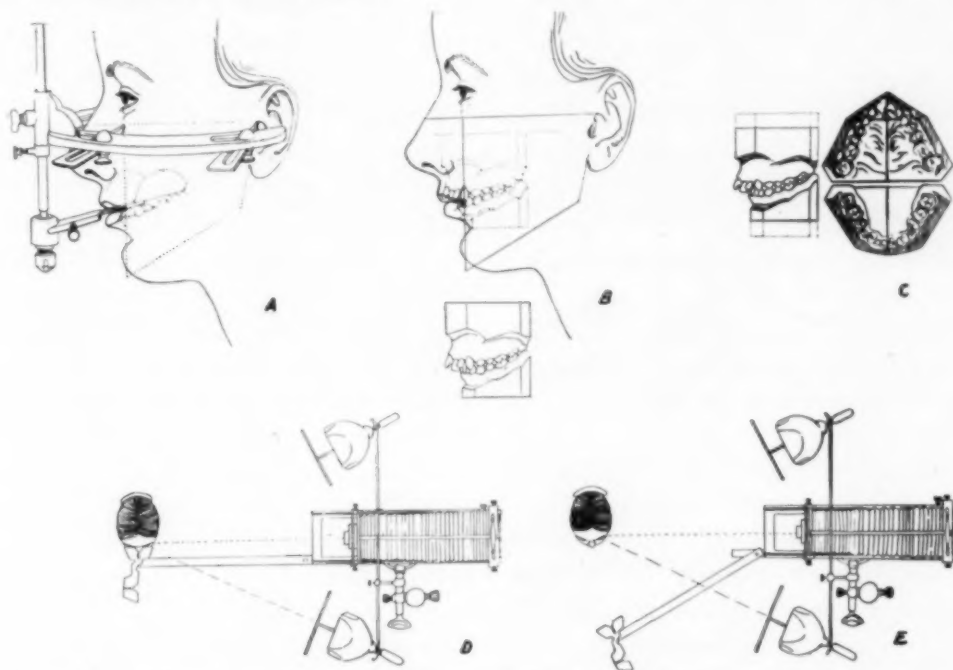


Fig. 2.—Sequence of steps in making denture reproductions and facial records. (a) Gnathostatic face-bow in position in obtaining the upper impression. (b) The principle of gnathostatic denture reproductions, revealing not only every dental detail, but showing the position of the denture in the face. (c) Completed denture reproduction showing the means employed to identify its position in the face. These casts are usually made 8 cm. in height, although this dimension may be varied if desired, and they may be made 6 cm. in height. (d) The principles involved in the use of the photostatic clinical camera, showing the noseboard for establishing the correct focal distance, and the standard plan of lighting. (e) The noseboard removed during the photographic exposure.

**The Facial Record.**—With our heightened appreciation of the nature and scope of dentofacial anomalies, and especially the fact that these frequently extend beyond the immediate boundaries of the denture, some form of facial reproduction becomes essential to diagnosis. These reproductions may be procured by several methods, such as plaster facial masks, roentgen-ray profile graphs, profile tracings, and photographs; but, to be practical they should be of

a nature obtainable with a minimum amount of effort by the practitioner and little wear and tear upon the patient. The photostatic clinical camera and the photographs obtained through its use provide a simple and satisfactory means to this end. The necessary apparatus, when once installed, is easily and accurately operated, and the records obtained are as useful and essential as our denture reproductions. As a matter of fact, one supplements the other, and both are necessary if the problem of diagnosis is to be efficiently visualized.

*In keeping with anthropologic custom, such photographs are made of the left profile* and are taken with the median plane of the head parallel to the plate or film. A frontal view may also be made where deemed necessary. The focal distance is established through the use of a photostat beam so that the image always appears in a definite ratio of life size, one-fourth or one-half life size being sufficiently comprehensive to answer all practical purposes. When the standard size is selected, the camera is set for this size only, so that all pictures of patients may be made under the same exact conditions. The advantage of this standardized plan becomes obvious when successive pictures of patients are made and growth changes resulting with treatment are to be recorded. The principles involved, both as to position and lighting, are shown graphically in Fig. 2, so that further details of a descriptive nature will be omitted.

In order that such photographs may be used for purposes of analysis, two planes of the face, as well as a linear representation of the mandible, must be indicated upon them. To prepare for this, small round spots of black adhesive paper are placed upon the patient's face at the measure points desired before the exposure is made. Later, upon the photographic print, a line is drawn from the orbitale to the tragon, thus indicating the Frankfort horizontal plane, and from the orbitale a line is drawn perpendicular to this horizontal plane, extending downward to or below the level of the chin, thus indicating the orbital or frontal plane. In addition to these, a line is drawn downward from the tragon (ear point) to the gonion (mandibular angle point), and from this point a line is extended to a point on the mandible farthest toward the front and below the chin (the gnathion), thus indicating, in an approximately accurate manner, the length of the ramus and the mandibular angle. The sequence of steps essential to complete this charting are shown in Fig. 3. The advantages of this method become obvious when results are compared with the ordinary unrelated facial photographs. In Fig. 4, a series of such photostatic clinical records are shown, and facial growth changes occurring with orthodontic treatment are demonstrated. These have been further analyzed by carefully tracing the facial patterns for purposes of comparison. Through the use of the measuring planes in the face, and the linear representation of the component parts of the mandible, we not only complete our facial record in harmony with similar identifications upon our denture reproductions, but show effectively the cranial relations of the jaws. Such a record enables us to observe and study the points, lines, angles, and confirmation of the features, and especially of the lower half of the face, often referred to as "the changeable area," and discern therein aberrations of growth, having a direct bearing upon our problem. In Fig. 5, facial areas of importance to diagnosis are shown.



*The Making of a Diagnosis.*—With all of the aforementioned information available, we may then proceed with the task of making a diagnosis. If this is to point the way to intelligent treatment in any given case, it must reveal the difference between existing conditions and those which it is desirable to establish. The former constitutes the anomaly, the latter the norm.

This brings to the fore the question, "What is the normal?" What standard shall influence us in determining the difference between the anomalous relationships and those to be established? We may examine hundreds of persons who possess oral conditions falling within the range of the normal and find a large number of dissimilarities among them. In other words, variabilities will be apparent which will range all the way from mild to extreme differences. In computing the normal type, therefore, we are faced with the necessity of *carefully considering essential similarities*. The constant recurrence of these essential similarities gives us what we call the "normal average."

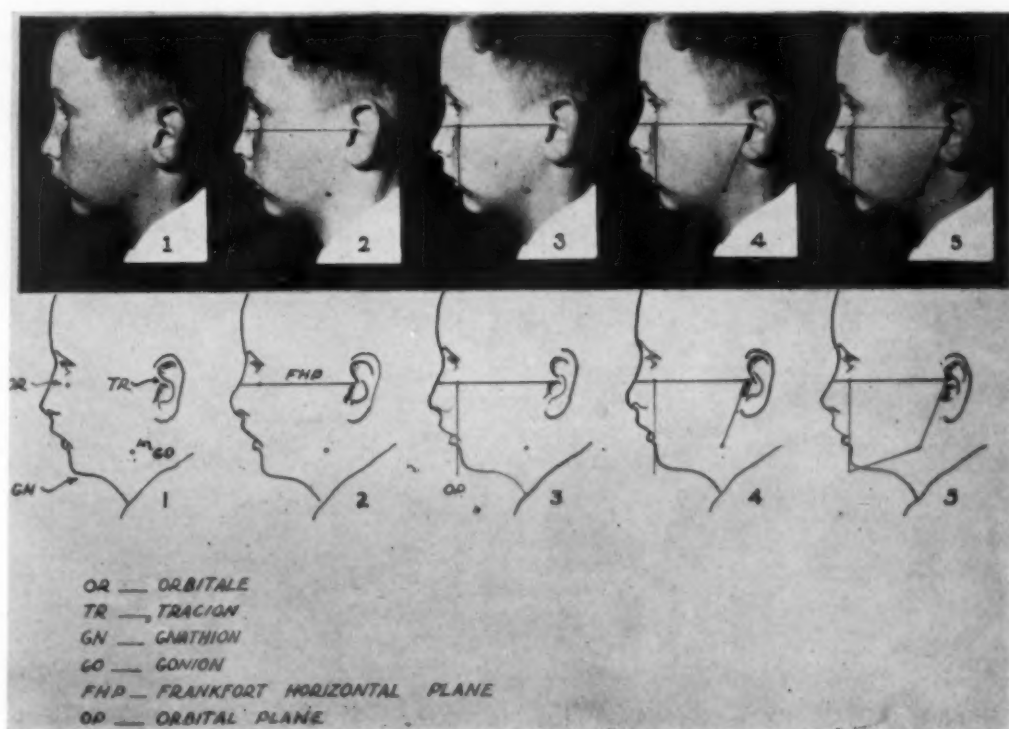


Fig. 3.—The sequence of steps essential to complete the charting of photostatic facial records.

There is no escape from the use of this helpful principle, for the exact ideal normal does not exist. On the other hand, anyone who attempts the correction of an oral deformity must have an end in view, i.e., the condition which it is desirable to establish, and this should be previously conceived. This must first be thought of on the basis of the general, or average characteristics applicable to the race or races from which our patients come. Utilizing such calculating points, the next step then consists in considering each case upon the basis of its individual type requirements.

(a) We know that, where anomalous involvements are present, one or both of the dental arches may be too narrow or too wide. By observing, in our

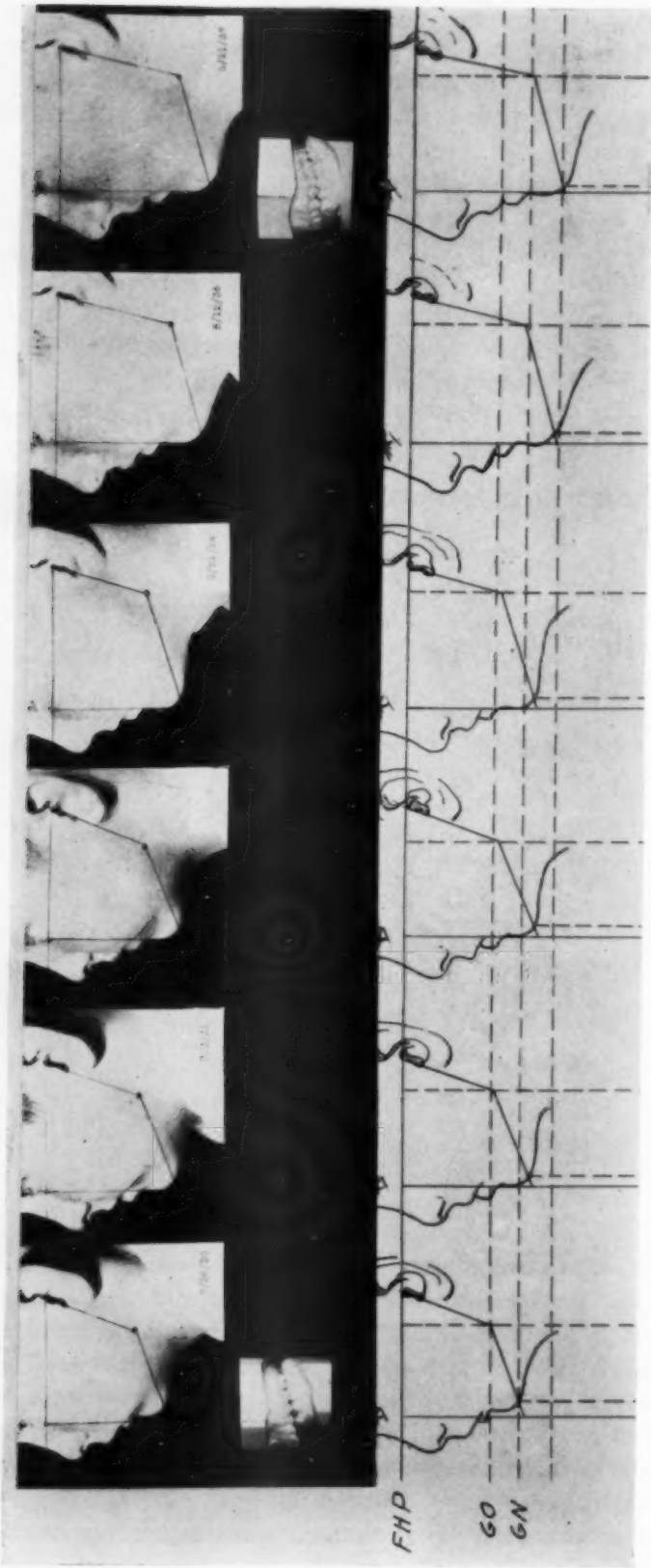


Fig. 4.—A series of photostatic clinical records showing the facial growth changes occurring during orthodontic treatment. By carefully tracing the series, interesting comparisons are made available.

denture reproductions, their relationship to the median plane, we may immediately discern whether the condition is symmetrical or asymmetrical, unilateral or bilateral, anterior or posterior, its extent, and whether the teeth only are contributing, or the anomaly extends beyond these boundaries into the maxilla, or the mandible, or both.

In undertaking the treatment of abnormal dental arches, we must decide what form and dimensions shall be established. If some of the teeth are crowded out of alignment, this decision is of great practical significance. The use of Pont's Index (Fig. 6) as a table of normal averages for this purpose will prove satisfactory. From it, desirable dental arch proportions are quickly made available for critical consideration.

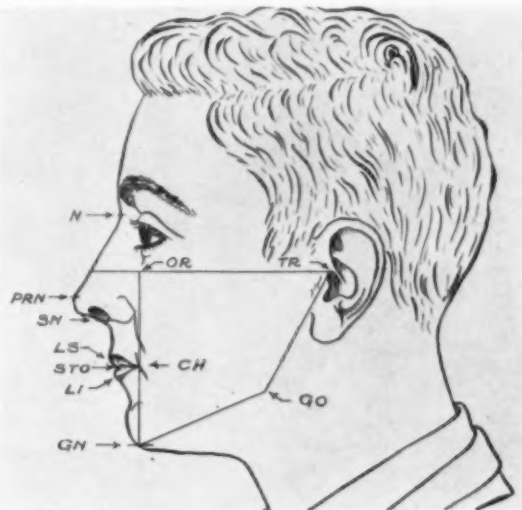


Fig. 5.—Profile points of importance in judging dentofacial relationships: *n*, nasion; *prn*, pronasion; *sn*, subnasion; *ls*, labrale superius; *sto*, stomion; *ch*, cheilion; *li*, labrale inferius; *gn*, gnathion; *or*, orbitale; *tr*, tragon; and *go*, gonion.

(b) We know that the denture or some of its parts may also deviate from the normal in their anteroposterior relationships and that such deviations may include the upper or the lower teeth, or both, or that it may be limited to groups, such as the anterior teeth, or that dental derangement may not constitute all of the involvements, but that these may extend into and include portions of the maxilla, or the mandible, or both. If the mandible is involved, the rami may be affected to the greatest extent or the horizontal portions may be equally contributing. The orbital plane offers a helpful means of identifying these abnormalities. This intersects the denture in the region of the canine teeth, and, while it has been the source of a considerable amount of controversy, due largely to misinterpretation of its application, it, nevertheless, serves a most useful purpose *in identifying the position of the denture in the face and in providing a starting point for judging the sagittal relations of the teeth and jaws*. Suffice it to say that a denture is not always to be considered abnormal if the orbital plane fails to pass through the canine teeth, although a pronounced deviation from this relationship usually indicates an anomaly. In such cases the photo-static diagnosis will usually reveal information making possible a definite decision. It should also be apparent that in studying the topography of the den-

ture in its relationship to the orbital plane, and also in conjunction with the raphe-median plane, the degree of symmetry, or lack of symmetry, immediately becomes apparent as do other abnormal involvements.

(c) In further considering the relationship of the denture in the face, we must realize that it may, in part, or as a whole, deviate in its horizontal relations. In other words, it may in one, or in a variety of combinations, be too high or too low in its position, and, in judging the possibilities of such a situation, we use the relationship it bears to the Frankfort horizontal plane. This is represented by the top of the base of our denture reproductions and is also indicated upon our facial reproductions. Variations from the normal in degree and extent, i.e.,

If the combined mesio-distal diameters of the four upper incisors are equal to:	The distance between <u>4</u> to <u>14</u> must then be about:	The distance between <u>5</u> to <u>15</u> must be about:
25	31	39
25.5	32	39.8
26	32.5	40.9
26.5	33	41.5
27	33.5	42.5
27.5	34	42.96
28	35	44
28.5	35.5	44.5
29	36	45.3
29.5	37	46
30	37.5	46.87
30.5	38	47.6
31	39	48.4
31.5	39.5	49.2
32	40	50
32.5	40.5	50.80
33	41	51.5
33.5	42	52.3
34	43	53
34.5	43.5	53.9
35	44	54.5

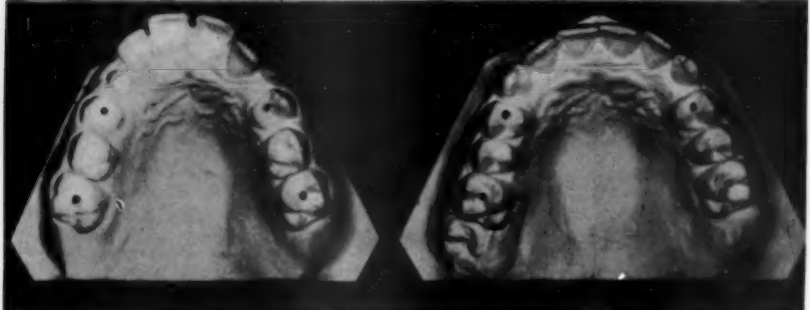


Fig. 6.—Pont's Index, with measuring points indicated upon the upper bicuspid and molars. The casts on the left show the teeth and palatal structures at the time treatment was started, and those on the right are of the same mouth after the case had progressed well toward completion.

whether symmetrical or asymmetrical, unilateral or bilateral, whether the anterior or posterior, or all parts of the denture are involved, soon become apparent to the clinician adopting such means of observation and study. *One factor of great diagnostic value is the ability to judge the pitch of the occlusal plane, for any sharp variation from its average degree of angularity will usually indicate an anomaly.* The average degree of angularity between the occlusal plane and the Frankfort horizontal plane will approximate 11 degrees for the right side and 13 degrees for the left side. The fact that it is rarely the same



on both sides will come as a surprise to those accustomed to judging degrees of so-called "malocclusion" from "unrelated plaster casts" *which are usually trimmed with meticulous care so that the occlusal plane is parallel with the base of the lower cast.* While in rare instances such a situation actually exists, the establishment of this arbitrary relationship of the plane in such denture records has doubtless proved misleading in thousands of cases.

It is impossible to numerically express the average distance between the occlusal plane and the Frankfort horizontal plane, for this is dependent upon the variable factors of head form, tooth length, and age. However, where an extreme increase or decrease in this distance is evident, *as compared to conditions usually encountered,* an anomaly may be detected, at least in a negative manner.

In the study of that part of our data contained in our facial reproductions, rules in the appraisal of facial outlines will be helpful in noting deviations from the average norm. These are rendered more simple through the study of Fig. 5. It will be noted that the anterior curve of the chin is usually found to lie wholly in front of the orbital plane. Any different relation immediately causes us to look for an abnormal involvement of the mandible, either anteroposteriorly, or with manifestations of arrestment of development in the bone itself. The gnathion in the well-developed face usually lies in the immediate vicinity of the orbital plane. The mentolabial sulcus is more or less receding, and the course of the oral fissure is usually at right angles to the orbital line, while the curve of the upper lip is slightly concave. The Frankfort horizontal plane passes through the middle of the dorsum of the nose, so that, if we draw lines parallel to it, causing one to pass through the root of the nose, another through the subnasion, and still another through the gnathion, we shall find that the perpendicular distance between these lines will not vary to any great extent. Any departure from this relationship should lead us to look for some morphologic deviation and seek to determine the various structures involved in it. Helpful appraisal of the proportionate length between the body and ramus of the mandible may be achieved by studying the lines drawn from the gnathion to the gonion and from the gonion to the tragon. In our photostatic projection these should approximate each other in length (in actual anatomic measurement this, of course, would not be true). Through the utilization of the angles formed by these lines, favorable or unfavorable developmental tendencies may be judged.

All of these anomalous involvements may be recorded upon a record chart or, if desired, "graphs," or curve diagrams may be made to supplement our other recorded material. *The most important of this, however, is contained in our written roentgenographic, denture, and facial records. These reflect the anomalous conditions.* When these are compared with what our clinical experience has schooled us to know relative to the normal, the difference becomes immediately apparent.

A helpful plan, so far as dental arch proportions are concerned, may be followed by recording their important measuring points in keeping with Pont's Index on the top of the cast. *These helpful measuring points are, therefore, always available, and comparative measurements with the casts and the patient's denture are obtained through the use of orthodontic calipers.*

These careful methods of recording anomalies have added one more link to the chain which has heretofore been missing, i.e., we are now able to determine with a reasonable degree of accuracy what we do to our patients when we treat them. In our clinical reports in the past, we have made extravagant statements upon purely ocular evidence. We thought we had accomplished certain things. Now, when we adopt a plan of treatment, we can tell how nearly we achieve our aims. Even when it is granted that errors creep in during the application of the measuring principles, the vast improvement over our older methods is evident.

We all know that sound judgment is essential to all phases of successful practice, whether it be diagnosis, the evaluation of etiological factors, or treatment. It should be obvious, nevertheless, that any plan which makes it possible to see anomalies correctly, to judge their extent, to determine with a fair degree of accuracy which structures are involved will place the orthodontist in a better position to map out an intelligent plan of treatment.

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A FREQUENT VARIATION OF THE MAXILLARY CENTRAL INCISORS  
WITH SOME OBSERVATIONS ON DENTAL CARIES AMONG THE  
JIVARO (SHUARA) INDIANS OF ECUADOR

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THE Jivaro Indians, known as Shuara among themselves, are popularly referred to as "the headhunters." Those studied in the summer of 1938 were found dwelling in the jungles on both banks of the Upano River, about seventy-five miles south of Macas and east of Mendez, at the foot of the eastern slope of the Andes, Dep't of Oriente in Ecuador, South America.

For comparative study, two groups were selected, confined only to the males of varying ages from preadolescence to adulthood, selected at random.

Group number 1, consisted of sixty-seven individuals, fifty-six adults and eleven preadolescents, who had had little or no contact with whites or with the world outside their community. They subsisted on a diet consisting of bananas, both roasted and raw, herbs, roots, berries, nuts, yucca or manioc tuber, maize, fish, the meat of monkeys, wild pigs, and birds. The mainstay of their diet is a manioc beer, prepared by the women, who masticate the manioc tuber thoroughly, incorporating it with saliva and expectorating the solution into a container. After several days' fermentation, this beer is drunk in copious quantities by everyone including the small children. A persistent custom among most of the individuals was that of chewing the nashumbi berry, identified botanically as "*Manettia coccinia*," which produces a brownish lacquer-like coating over the teeth. It is not known if this inhibits tooth decay or not.

The examination of the teeth of these individuals was attended with considerable difficulties since tribal customs prohibit the touching of the faces of children and women by strangers. Plaster casts of the teeth were made of the majority of those examined, but since dental instruments were not used, tabulation of tooth cavities was made by observation with the aid of a tongue depresser and mouth mirror. The records made represent the types of tooth positions in the dental arches and the minimum of carious cavities present in each individual and will serve as a comparative, relative record rather than an absolute index. The results of this examination revealed fifty-five individuals or 82 per cent of all with maxillary central incisor teeth, which were either rotated, overlapped or otherwise misplaced in the dental arch. In some individuals there was also a misplacement of the mandibular central incisors (Figs. 1 to 7). In all adults of this group, a complete permanent dentition was the rule, with no other misplacements of teeth than the affected central incisors having been noted. No explanation of the existence of this variation of the positions of the central incisors can be given other than it is a persistent

Paper presented before the following meetings: The Annual Meeting of the American Association of Physical Anthropologists, New York, May 3, 1940; The American Scientific Congress, Washington, D. C., May 14, 1940.

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variable, which cannot be classified merely as a form of malocclusion. The same variations have been noted in certain groups of Tarascan Indian skulls, in the collection of the American Museum of Natural History, in New York and Hrdlicka has found similar variations among the Pecos Indians in the southwestern United States. In group 1 malocclusion affecting the remaining dentition, was noted only in preadolescent boys and girls, although it was impossible to make plaster cast records of most of those seen. This may offer some evidence

Fig. 1.



Fig. 2.



Figs. 1 and 2.—The dental occlusions of four Jivaro male adults, with diagrams illustrating types of maxillary incisor rotations.

to the contention that malocclusion of the teeth is associated with other systemic dysfunctions. In an environment such as this one, where the rigors of existence are so severe and the securing of sustenance and alleviative treatment for illness so uncertain, only those who are most fit to survive ever reach adulthood. This does not offer conclusive proof that most children with maloccluded teeth die





Fig. 3.—Jivaro father and two sons. *A*, Father, with fairly normal occlusion. *B*, Adolescent son, with unilateral maxillary central incisor rotation. *C*, Preadolescent son, with bilateral V-shaped maxillary central incisor rotation.



Fig. 4.—Two children showing maxillary central incisor rotations.

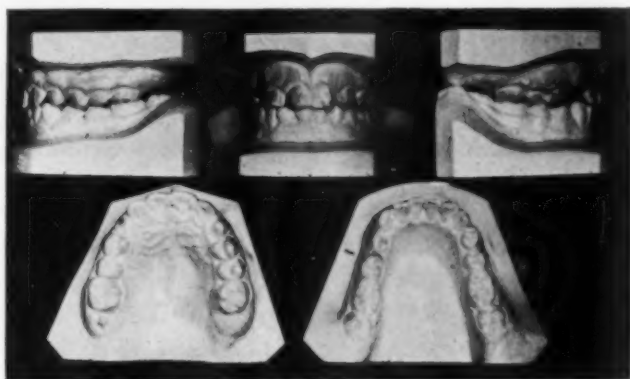


Fig. 5.—Four views of plaster models of incompletely erupted dentition of a pubescent boy.

before maturation, since it is possible for some tooth malpositions to correct themselves in conjunction with the added growth spurt which usually attends pubescent and postpubescent body alteration. However, the testimony of the fathers of families all coincided with the statement that children with irregular teeth rarely reached manhood, but died before that time.



Fig. 6.—Casts of four adult males showing maxillary first incisor rotations.

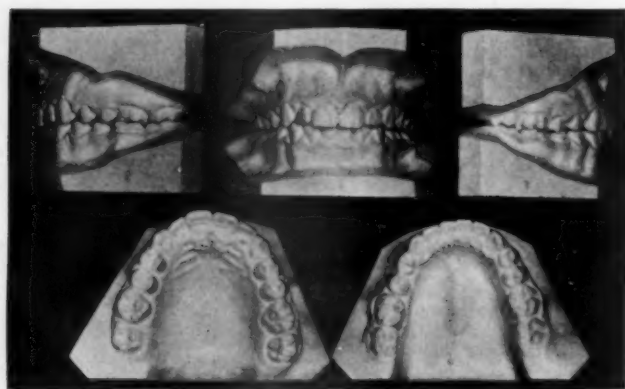


Fig. 7.—Plaster models of a pubescent girl.

Examinations of the dentitions of group 1 revealed a surprisingly low average of dental caries. Forty-one individuals or 61 per cent had teeth entirely free from dental caries, and, of those remaining, the greatest number of tooth cavities to be noted did not exceed five. Mandibular fourth molars were found in two individuals, but no other supernumerary or missing teeth were noted (Table III).


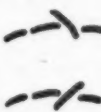
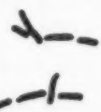
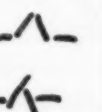
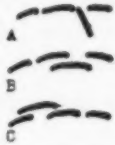
Group 2 consisted of eighty males, ranging from preadolescent to middle adulthood of which thirty-four were adults and forty-six, preadolescent. This group lived in the mixed white and Indian settlement of Mendez, approximately three days' journey from the region of group 1. This latter group was of the same racial stock and family as those of group 1, and originally lived in the same jungle environment, but are under the protection of the missionaries and are living in and about the mission settlement. Their customs and food habits had been altered to meet the requirements of a quasi-civilized community.

TABLE I\*  
DENTAL OCCLUSION

GROUP 1. 67 MALES			GROUP 2. 80 MALES	
CLASS	ADULTS 56	PREADOLESCENT 11	ADULTS 34	PREADOLESCENT 46
Good occlusion	18	3	16	14
Rotated Max. first incisors. Bal. oocl. fair-good	47	5	} 18	} 32
Rotated Max. first incisors. Gen. malocclusion.		3		
Fourth Mand. molars	2			
Rotated Max. first incisors total 55 or 82% of group 1			Total 50 or 82.5% of group 2	

\*Comparative study of the dental occlusion of groups 1 and 2.

TABLE II  
CLASSIFICATION OF MAXILLARY FIRST INCISOR ROTATIONS. GROUP 1\*

	Bilateral V-shape	Unilateral overlap	Unilateral not overlapped	Inverted V-shape	Misc.
					
Adults	28	9	4	4	2
Pre-adolescent	3		2	1	2

\*Most prevalent types of maxillary first incisor rotations. Fifty-five individuals of group 1 are classified according to type of malposition of the maxillary incisors. It was impossible to correctly tabulate group 2 in this manner because of local obstacles.

The usual diet of these individuals consisted of bananas as the only raw food, cooked meats, potatoes, rice and beans, bread, canned salmon, biscuits, coffee and carbonated beverages. Occasionally, cheap candy, cakes and sugar cane are available, the latter in ample quantities. Almost every individual suffered from gastric disturbances. Because of local obstacles, which could not be overcome, the making of plaster casts of their teeth and routine accurate dental examinations were virtually impossible, but cursory examinations for compara-

tive study had to suffice. With the exception of three adult individuals, no one was free from dental caries. Approximately 25 per cent had all their teeth affected with dental caries, and, in 35 per cent, from one to several teeth were missing. Of thirty-four adults, sixteen had good occlusions, while eighteen had fair occlusion, but with misplaced and rotated maxillary central incisors. Of the preadolescent members of this group, fourteen had good occlusions and thirty-two were affected with malocclusions of varying degrees, all of whom had misplaced and rotated maxillary central incisors. Of a total of eighty individuals in group 2, fifty or 82.5 per cent were affected with maxillary central incisor misplacements (Tables I and II).

TABLE III\*  
NUMBER OF TOOTH CAVITIES

GROUP 1. 67 MALES			GROUP 2. 80 MALES	
CLASS	ADULTS 56	PREADOLESCENT 11	ADULTS 34	PREADOLESCENT 46
Free from caries	32	9	3	
1 cavity	15	1		
2 cavities	1			
3 cavities	4		31	46
4 cavities	1			
5 cavities	3	1		
			(Comparative records) 25% of all had cavities in almost all teeth 35% had missing teeth	

\*Comparative study of tooth cavities of groups 1 and 2. It was impossible to tabulate group 2 in detail except to show results of a cursory examination for a comparative study.

#### CONCLUSIONS

In comparing the dental conditions of the two groups, the factor of misplacements of the maxillary central incisors is a persistent variable which is constant for both groups. With 82 per cent in group 1 and 82.5 per cent in group 2, there is a variance of only .5 per cent for affected teeth, a curious coincidence. There is another factor to be noted, namely that of the wide variance of dental caries between the two groups. The change in food habits is undoubtedly responsible for the increase in dental caries in group 2, but this change in environment does not alter the inherited tendency to variation in occlusion common to both groups.



## THE LEGAL STATUS OF THE ORTHODONTIST

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IN CONSIDERING the legal status of an orthodontist, we must, of necessity, give some of our attention to his legal position as a dentist, rather than as a specialist operating only in the field of orthodontics. Only in rare instances does the law treat with the orthodontist in his field as a specialist. Even then, it does not establish any special rules applying only to orthodontists, but adopts the rules which are applicable to all specialists in the healing arts. Generally speaking, however, the same principles of law govern the orthodontist and other specialists as govern the general practitioner. Exceptions are made only in those cases where it is proper to do so, because of the fact that the public has the right to expect a greater degree of skill or knowledge from a specialist when the particular question involved falls within the scope of the field of his specialty. In this discussion, we shall note those exceptions when they occur, but otherwise, the principles hereinafter set forth are applicable not only to the specialist, but to the general practitioner as well.

Characteristic of this situation is the fact that the word orthodontics or orthodontist, at the present time, is not even mentioned in the Dental Practice Act of California. No special license or certificate is required by law to practice orthodontics here other than a license to practice dentistry. Until the year 1939, Section 1631 of the California Dental Practice Act prescribed by name the various subjects in which the Board of Dental Examiners should examine applicants for license to practice dentistry. Orthodontics was on the list. In 1939 the legislature amended the law to eliminate, entirely, the list of required subjects and to insert in lieu thereof a provision which no longer enumerates any specific subjects, but provides that the subjects in which the applicant shall be examined shall be such subjects as the Board may, from time to time, prescribe, provided that the subjects shall be selected in accordance with the trend of dental education in California. Thus, the only reference to your specialty in the statutory law regulating the practice of dentistry in California was eliminated in favor of a section vesting the Board with more or less discretion as to the subjects of examination.

No professional man can rightly appreciate his legal status as a professional man unless and until he at least has a working knowledge of the provisions of the statutory law regulating his profession in his governmental jurisdiction. Many men of the profession confuse the rules of ethics of the American Dental Association with the statutory law as prescribed by the legislatures of the respective states. The two are not necessarily synonymous.

A brief review of a few provisions of the California Dental Practice Act, which provisions are, in substance, contained in the regulating laws of the

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majority of the states of the Union, would seem to be pertinent. Well-meaning practitioners often run afoul of the law and, in some instances, have been deprived of their licenses merely through ignorance of the provisions of the statutory law.

In considering the statute known as the Dental Practice Act of California, we concern ourselves with the legislative steps taken in your forward march toward being a specialist in the field of medicine. At the beginning of the nineteenth century, there was no real dental profession, and at the same time there were little or no legal restrictions on the practice. True, dentistry was practiced, but its practitioners were mostly without formal instruction, license, or authority, and the political governing bodies gave them no legislative recognition. The art was carried on by surgeons, blacksmiths, goldsmiths, and jacks-of-all-trades. Since then, there has developed a strong, substantial body of men possessed of the qualities that characterize a true profession. Intensive educational requirements are now set up by law in order to qualify an intending licentiate. This development has been inevitable. We need not relate the history of this transition, but concurrently with our assumption of our professional status, we are, and should be, charged with the same standards of professional education, training, and conduct as custom and law require of other true professions. But the struggle of dentistry in this respect has not been easy.

In considering our Dental Practice Act, we concern ourselves with legislative efforts to elevate standards and relationships to the public. Movements to enact and thereafter to improve the Act by amendments have ordinarily originated within the ranks of the profession. In validating contested dental legislation, the United States Supreme Court said: "What is generally called the ethics of the profession is but the consensus of expert opinion as to the necessity of such standards."

The task of securing legislative and judicial recognition of those necessary standards has been arduous because of the unwillingness of a small minority of dentists to leave behind practices and methods of unlicensed predecessors. These minorities seek to maintain the right to practice the profession on the same commercialized basis as was used in the days when the States were nearly all without statutes to regulate the professions.

The Dental Practice Acts and the decisions of the courts in interpreting these statutes are reliable measures of the progress made by the profession to elevate its standards.

A provision usually found in various statutes of the several states forbids a dentist from practicing under any name other than the name under which he is licensed. For example, the Board has recently had under consideration a case wherein it is alleged that a certain group of dentists, practicing orthodontics, were practicing under a false, assumed, and fictitious name in that the business was conducted not under the names of the dentists, but under a fictitious name, such as the X Dental Clinic.

Practitioners should avoid the use of institutional names in conducting their practices.

It has been urged that the prohibition of the statute did not apply unless the use of the fictitious name amounted to a fraud upon the public, i.e., that it must amount to a representation that the dentist is, in fact, another person, or be a fraudulent concealment of identity. The courts however, do not indulge in such a narrow construction of the law and state that the provision is aimed at conduct much less reprehensible than fraudulent misrepresentation. The courts have said that the legislature intended that a person to whom the privilege had been granted of practicing dentistry and representing himself to the world as qualified and worthy of the confidence of those in need of one of the healing arts, should, when offering his services, do so under his own name. This simple requirement was not aimed particularly at the person who is willing to incur the odium of actual fraud but was designed to offer a much wider protection to the public by assuring to it a reasonable certainty of knowing in every case precisely with whom it was dealing, the importance of the relation of dentist and patient, and the various serious consequences which might follow improper, unskillful, or negligent treatment rendering such openness and candor particularly desirable.

Another provision of law includes, in the definition of unprofessional conduct, the aiding and abetting of an unlicensed person to practice dentistry. Many questions arise in this case as to how far a dentist may go in permitting his office assistant to aid him in performing a dental operation. Recently the Board of Dental Examiners had before it the question of whether an orthodontist was guilty of unprofessional conduct in aiding and abetting an unlicensed person to practice dentistry in that he permitted his unlicensed office assistant to make certain adjustments of the bands on the teeth of a patient. The Board held that the acts of the assistant did constitute a dental operation, and, therefore, the orthodontist, in permitting his assistant to perform the dental operations in his office, was guilty of aiding and abetting an unlicensed person to practice. Similar cases are not unusual because of the failure of the dentist to know what acts actually constitute a dental operation.

It is not necessary that the person performing the act receive remuneration in order to be guilty of practicing dentistry. Until 1935 the California law provided that one who performed a dental operation for fee, salary, or reward was practicing dentistry. In 1935 the phrase "fee, salary, or reward" was stricken from the law.

The California definition of practicing dentistry, which, in substance, is a definition common to many of the states, is as follows:

"A person practices dentistry within the meaning of this chapter who does any one or more of the following:

(a) By card, circular, pamphlet, newspaper, or in any other way advertises himself or represents himself to be a dentist.

(b) Performs, or offers to perform, an operation or diagnosis of any kind, or treats diseases or lesions of the human teeth, alveolar process, gums or jaws, or corrects malposed positions thereof.

(c) In any way indicates that he will perform by himself, or his agents or servants, any operation upon the human teeth, alveolar process, gums or

jaws, or in any way indicates that he will construct, alter, repair or sell any bridge, crown, denture or other prosthetic appliance or orthodontic appliance.

(d) Makes, or offers to make, an examination of, with the intent to perform or cause to be performed any operation on, the human teeth, alveolar process, gums or jaws.

(e) Manages or conducts as manager, proprietor, conductor, lessor, or otherwise, a place where dental operations are performed."

You will observe that subdivision (b), above mentioned, refers to an operation of any kind, or treatment of the human teeth, alveolar process, gums, or jaws, or correction of malposed positions thereof. Likewise, section (c) refers to "an operation upon the human teeth." There has been much controversy as to the definition of "an operation." In *Whetston vs. Board of Dental Examiners*, volume 87 of California Appellate Reports, page 156, the District Court of Appeals was concerned with this definition in a case where one of the nurses of the office of the accused injected some medicine into the gums of a patient, scraped the tartar off the teeth, and apparently cleaned them. The Court held this to constitute a dental operation and said the following:

"In relation to the intent of the legislature in using the word 'operation,' it is there said: It does not require the performance of a surgical operation to bring one within the purview of the law. The words 'operate' and 'operation,' technically used in connection with surgery, mean 'to perform some manual act upon the body of the patient, usually with instruments, with a view to restore soundness or health, or otherwise improve the physical condition,' and 'the act or series of acts and manipulations performed upon a patient's body, as in setting a bone, amputating a limb, extracting a tooth, etc.' (Century Dictionary.) They have also a plain, ordinary meaning, in the light of which this act may and, we think, should be construed. According to the authority just quoted 'operate' means 'to perform or to be at work'; 'to produce an effect, etc.'; 'work,' and 'operation' means 'action,' 'working,' 'a specific act or activity,' and 'the course of action or series of acts by which some result is accomplished.' The same dictionary defines 'an operator' as one who operates in any way, or on or against anything."

It is especially significant to note the broad interpretation given to the word "operate." The Court construed it to mean not necessarily a surgical operation but rather the performance of a course of action or series of acts by which some result is accomplished. "Operate" was thus construed in its plain ordinary meaning, rather than in any technical sense. It is therefore incumbent upon every practitioner to make due inquiry as to what he, himself, must do and as to what acts he may permit his assistant to perform.

A third provision of the Dental Practice Act, which provision is gradually appearing in the laws of other states, is a section which has, as its purpose, the insuring of a closer relationship between the proprietor dentist and the patients of the office. In 1939 the California legislature adopted a law which provides that any dentist desiring to open an *additional* office must first obtain the consent of the Board of Dental Examiners. Some states have approached the problem by providing that a practitioner may not have more than a given number of offices, but specifically excepts orthodontists. The California law



makes no such exception. Any dentist now possessing one or more offices, who desires an additional office, must make application to the Board. This body, however, appreciating the fact that the purpose of the law is to curb absentee ownership of offices, has adopted certain rules and regulations which take into consideration the fact that orthodontists, for the convenience of their patients, have various branch offices where they render personal services. In line with the obvious purpose of the law, the Board has adopted rules and regulations which require an applicant to file his request upon a rather elaborate application, which is designed to distinguish the dentist who wishes to extend his field of personal service from those who would enrich themselves through the medium of hiring dentists.

Every applicant for an additional office is now required to certify that he will be personally in attendance at the requested additional office a majority of the time daily during which the office is open for examination, diagnosis, or treatment of patients. This requirement will not interfere with the practice of the specialist, who has a series of offices, each of which he visits from time to time. Nevertheless, he must, in the event he desires to open additional offices, make application to the Board.

In connection with the interpretation of this law, it is interesting to note that it refers to "additional places of practice." The Board has concluded that, in order to have an additional place of practice, there must be an increase in the number of places of practice. Therefore, since mere removal does not increase the number of places, one may remove his office from one location to another without having an additional place of practice. Thus, in a case where we are concerned with a mere removal, the dentist will have to register the new address with the Board but does not have to obtain permission to remove his place of practice.

The foregoing discussion refers merely to a few pertinent provisions of the Dental Practice Act. It is recommended that the practitioners acquaint themselves with similar provisions from the laws of their respective states.

Heretofore, we have devoted much time to the discussion of the relationship between the dentist and the state so far as his legal status is concerned. We shall now devote some attention to the question of his relationship with his patients.

The welfare of the citizens of the state requires that those persons who are licensed by it to conduct any of the healing arts shall be duly able and careful. Therefore, even in the absence of any statute, the common law holds every dentist answerable for an injury to his patient, resulting from want of the requisite knowledge and skill, or the omission to use reasonable care and diligence, or the failure to exercise his best judgment. The purpose of this declared public policy is to protect the public, particularly the weak or credulous, from the unskillfulness or negligence of practitioners by holding such practitioners liable to respond in damages for the result of their unskillfulness or negligence. It is universally admitted that a dentist is answerable to the injured party for failure to exercise the requisite skill and care. What is meant by requisite skill and care is another matter. The overwhelming weight of authority has established the rule that a dentist, in order to escape the danger of civil liability to a patient, must possess that reasonable degree of learning,

skill, and experience, which ordinarily is possessed by others of his profession; that he must exercise reasonable and ordinary care and diligence in the exertion of his skill and in the application of his knowledge; and that he must exert his best judgment as to the treatment of the case entrusted to him. In other words, he is bound to bestow the same reasonable and ordinary care, skill, and diligence as dentists in the same neighborhood in the same general line of practice ordinarily have and exercise in like cases. Unless a dentist contracts to do more, he is held only to a reasonable amount of diligence and skill and is liable only for injuries resulting from neglect to exercise that degree of diligence and skill. However, what is particularly important to this group is the modification of this general rule, which modification applies to specialists.

An orthodontist holds himself out to the public as a specialist in a certain field of dentistry. He represents that he is better equipped and more skillful in the treatment of the correction of irregularities in the teeth than is the general practitioner. A dentist who holds himself out as having such special knowledge and skill is bound to bring to the discharge of his duty to patients employing him as a specialist that degree of skill and learning ordinarily possessed by dentists who devote special attention and study to such special field, having regard to the present state of scientific knowledge. Since he is employed because of his peculiar learning and skill in the specialty practiced by him, it follows that his duty to the patients cannot be measured by the average skill of general practitioners.

When a dentist undertakes the treatment of the case, he does not, as a matter of law, guarantee a cure, nor is any promise to effect a cure or even a partial healing to be implied. The law does not raise from the fact of employment an implied undertaking to cure but only an undertaking to use ordinary skill and care if he is a general practitioner, or the special knowledge and skill, which, as a specialist he represents himself to have. Of course, a professional man might contract specifically and expressly to effect a certain result, and, if so, he would be liable on his express contract for failure; but in the absence of such a special and peculiar contract the fact that the treatment has resulted unfavorably does not even raise a presumption of the want of proper care, skill, or diligence. He is not to be held responsible merely on the score that the treatment was not successful and was accompanied by untoward consequences. It must be made to appear that he knew or ought to have known that the consequences complained of would result from his acts or treatment, and proof that the consequences were, in fact, unforeseen by him, does not establish liability. The practitioner is not omniscient or incapable of invariably knowing that his professional acts will always achieve the desired results. He is deemed responsible only where it is established by the complainant that he did not act with the knowledge or foresight of specialists generally, assuming that he is a specialist, or as a reasonably skillful or experienced specialist would have acted in the same circumstances. As a specialist, he is deemed to represent that he is possessed of this degree of knowledge and nothing more.

Occasionally the question is raised as to whether a dentist's relationship to the patient is similar so far as the law of confidential communication is con-

cerned, as in the case of physician to his patient. Early in the history of the law, there was developed a rule to enable a physician to treat his patients to advantage. The law recognizes that it is necessary for the patient to communicate information which it would be both embarrassing and harmful to have circulated throughout the community. Recognition of this fact is given by statutes in most jurisdictions, giving a measure of protection to the patients from disclosure of confidential communication by physicians on the witness stand. The California rule in this respect is found in Section 1881 of the Code of Civil Procedure, where it is stated that a licensed physician and surgeon cannot, without the consent of his patient, be examined in a civil action as to any information acquired in attending the patient and which was necessary to enable him to prescribe or act for the patient. You will observe that a dentist is not mentioned. It has been held in some states that dentists are not physicians and surgeons in interpreting similar sections of the law. We point out, however, that the California Dental Practice Act defines as unprofessional conduct the willful betrayal of professional secrets. This section has never been construed by the courts, and what constitutes a professional secret is still a matter of judicial interpretation so far as the Dental Practice Act is concerned.

In connection with malpractice cases, the question of the Statute of Limitations would seem to be of particular interest to those practicing in the field of orthodontics, because of the fact that patients are generally under the age of majority. The so-called Statutes of Limitations of the various states are the enacted laws which decree the period after the incurring of damage within which an action must be instituted in a court of law in order to prevent the action from being outlawed. The general rule in California on the question of actions for malpractice is that the action must be commenced within one year following the acts of which the patient complained. However, there is a statutory exception to the rule, which is particularly important to orthodontists, which exception is that the statute does not run against the cause of action accruing to a minor during the period of his minority. Section 352 of our Code of Civil Procedure says that, if a person entitled to bring an action be, at the time the cause of action accrues, within the age of majority, the time of such disability is not a part of the time limited to the commencement of the action. Thus, the statute does not commence to run against the rights of a minor until he reaches the age of majority. From a practical angle, however, this is not so serious a matter as it might seem to be because the burden of proving the injury is upon the complaining party, and that burden usually becomes more difficult with the passage of any protracted period of time. A minor in California is any person under the age of 21, except that a female who has contracted a lawful marriage and is of the age of 18 or over shall, for certain purposes, be deemed to be of the age of majority and to be an adult person, the same as if she were 21 years of age.

In conclusion, we observe that there is need for a greater dissemination of the rules of dental jurisprudence among the respective members of the profession. The practice of dentistry is subject to reasonable regulations by the legislature. It is today regarded as one of the learned professions. It is a calling which may be pursued, not as a matter of right, but only as a privilege

granted by the state upon proof by the applicant that he is qualified by learning, skill, and character to assume the duties and obligations and to share in the rewards of that profession.

The law has recognized the advances made by dentistry and has sought to protect the sincere practitioner, as well as the public, from the inroads of those who, because of human greed and avarice, unless controlled by law, would not hesitate to prey upon the frailties of overcredulous human beings. There are those avaricious members of the profession, who, in disregard of the ethics of the profession, are many times overcome by the great determination to become rich at the expense of humanity and have, in the past, resorted to all the devices of the fakir on the street corner and the skillful artisans of expert advertising and radio propaganda.

The law has made great strides in protecting the profession and the public from such licentiates. We have made great progress since the day when Paul Revere, who, as you may remember, was not only a very excellent horseman, but also a goldsmith and engraver, published the following advertisement of his activities in the Boston County Journal on Aug. 29, 1768:

"Whereas many persons are so unfortunate as to lose their Fore-Teeth by Accident, and otherways to their great Detriment, not only in Looks, but speaking both in Public & Private:—This is to inform all such that they may have them replaced with false Ones, that look as well as the Natural and answer the End of Speaking to all Intents, by Paul Revere, Goldsmith, near the Head of Dr. Clarke's Wharf, Boston. All Persons who have had false teeth fixt by Mr. John Baker, Surgeon-Dentist, and they have got loose (as they will in Time) may have them fastened by the above, who learnt the Method of Fixing them from Mr. Baker."

However, the task of complete protection is not finished. A greater appreciation of the difficulties of law enforcement and administration, as well as more understanding of the pertinent principles of law on the part of the dental profession, is desirable. We therefore suggest that the various dental organizations institute a program or plan for bringing to the profession a greater knowledge of the legal principles affecting it.



## THE DISTRIBUTION OF ORTHODONTISTS IN THE UNITED STATES

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SOME dentists may welcome the news of dentistry's declining birth rate. This seems like good news to those of us in practice until it is reviewed from all angles. The dental schools of the United States are and have been, for some years, graduating fewer dentists than leave the profession each year. The dentists of this country should be concerned when they learn that the ranks of their profession are actually dwindling even in the face of increasing work ahead.

In the ten-year period from 1920 to 1930 all of the dental schools turned out an average of only 2,400 graduates a year. In the next decade, 1930 to 1940, there was an average graduation of only 1809, a decrease of 26 per cent. Of the 1,809 graduating in 1939, 100 were foreigners who returned to their own countries. Approximately 100 failed to pass State Boards, and fifty or more went into teaching or public health service. This left only 1,550 to enter practice for that year, while the number leaving the profession during that period was 1,750. Dentistry faces an ever enlarging field of activity, an ever increasing amount of needed dental work, with its ranks thinning, its professional manpower decreasing.

The American people will some day in the near future become more thoroughly aroused to the advantage of dental care. When this time comes, the dental profession will find itself unable to cope with the demands put on its services, and it will be too late for the profession to correct it. The correction will, no doubt, be made by politicians, with a marked lowering of standards in order that the demand may somehow be satisfied.

The fact that this crisis does not threaten immediately does not relieve us of the responsibility to act now. The profession should decide whether it is not now wise to reverse the present trend toward a smaller and insufficient group. If the present trend is undesirable, then the profession, schools, and all others interested in the future of dentistry should encourage properly qualified men to look to dentistry as a life's work.

The fact that dentistry offers a dignified and honorable career with opportunity for great service to mankind should be presented to those wishing to enter this field. High school and college students must be made aware of the fact that dentistry is not a mere interloper on medicine, that it is a special field with opportunities for service equal to those of the medical profession, that dentistry's obligations, duties, and privileges are the same as those of medicine, and that the reason for the long course of training is not just to make it hard, but to prepare them adequately for the years of service ahead. If this is done, dentistry does not need to fear an influx of numbers large enough to lower its standards, as there is enough dental work to be done to keep any added number of dentists busy.

TABLE I

STATES AND CITIES	POPULATION	PER CENT POPULATION	ORTHO- DONTISTS	PER CENT ORTHO- DONTISTS	POPULATION PER ORTHO- DONTIST
Alabama	2,832,961	2.0	4	0.4	708,240
Arizona	499,261	0.4	5	0.5	100,000
Arkansas	1,949,387	1.5	6	0.6	324,900
California	6,907,387	5.25	132	14.0	52,300
Los Angeles	1,496,792		40		37,400
San Francisco	629,553		23		27,370
East Bay	448,725		17		26,400
Sacramento	105,784		5		21,150
San Diego	202,038		4		50,500
Fresno	60,644		3		20,200
San Jose	68,298		4		17,700
Stockton	54,513		2		27,250
Santa Barbara	34,438		3		11,400
Pasadena	81,566		6		13,600
Long Beach	163,441		3		54,500
Santa Monica	52,828		4		13,200
Palo Alto	16,728		3		5,600
Colorado	1,123,296	0.8	16	1.7	70,260
Connecticut	1,709,242	1.3	14	1.5	122,000
Delaware	266,505	0.2	2	0.2	133,250
District of Columbia	663,091	0.5	13	1.4	50,100
Florida	1,897,414	1.4	14	1.5	135,500
Georgia	3,123,723	2.4	14	1.5	223,100
Idaho	527,783	0.4	1	0.1	527,783
Illinois	7,897,241	6.0	58	6.0	136,100
Chicago	3,384,556		28		120,800
Indiana	3,427,796	2.5	19	2.0	180,200
Iowa	2,538,268	1.9	18	2.0	141,000
Kansas	1,801,028	1.3	13	1.5	140,000
Kentucky	2,845,627	2.0	7	0.8	406,500
Louisiana	2,363,880	1.7	12	1.3	197,000
Maine	847,226	0.7	4	0.5	202,000
Maryland	1,821,244	1.3	14	1.5	130,000
Massachusetts	4,316,721	3.3	39	4.0	110,600
Boston	769,520		26		29,600
Michigan	5,256,106	4.0	50	5.0	105,000
Detroit	1,618,549		28	3.0	57,800
Minnesota	2,792,300	2.0	15	1.6	186,100
Mississippi	2,183,796	1.5	4	0.5	545,900
Missouri	3,784,664	2.7	36	0.4	105,100
Montana	559,456	0.4	3	0.4	186,300
Nebraska	1,315,834	1.0	7	0.8	188,000
Nevada	110,247	0.1	2	0.3	55,100
New Hampshire	491,524	0.4	2	0.3	245,750
New Jersey	4,160,168	3.2	38	4.0	114,700
New Mexico	531,818	0.4	3 not ex- clusive		
New York	13,479,142	10.0	126	13.5	106,900
New York City	7,380,259		73		101,100
N. Carolina	3,571,623	2.6	13	1.4	274,700
N. Dakota	641,935	0.5	2	0.2	320,900
Ohio	6,907,612	5.25	48	5.2	143,900
Oklahoma	2,336,434	1.7	9	0.1	260,000
Oregon	1,089,684	0.8	5	0.6	218,000
Portland	307,572		4		77,000
Pennsylvania	9,900,180	7.5	43	4.6	230,200
Philadelphia	1,935,086		17		113,200
Pittsburgh	665,384		15		44,350
Rhode Island	713,346	0.6	6	0.7	117,250
S. Carolina	1,899,804	1.3	5	0.6	379,900

TABLE I—CONT'D

STATES AND CITIES	POPULATION	PER CENT POPULATION	ORTHO- DONTISTS	PER CENT ORTHO- DONTISTS	POPULATION PER ORTHO- DONTIST
S. Dakota	642,961	0.5	1 not ex- clusive		
Tennessee	2,915,841	2.1	11	0.1	265,000
Texas	6,414,824	5.0	43	4.5	149,100
Utah	550,310	0.4	2	0.2	250,150
Vermont	359,231	0.3	1 not ex- clusive		
Virginia	2,677,773	2.0	13	1.5	206,000
Washington	1,736,191	1.3	16	1.7	108,500
Seattle	366,847		10		36,680
Spokane	122,462		1		112,500
Tacoma	107,520		3		35,800
W. Virginia	1,901,974	1.4	5	0.6	380,400
Wisconsin	3,137,587	2.4	13	1.5	241,300
Wyoming	250,742	0.2	1	0.1	250,000

Dentistry must realize that self-reproduction is just as essential within a profession as within a race. The birth rate must keep pace or surpass the mortality rate if proper health and vigor are to be maintained.

This survey of the dental profession is given to show that there is a great opportunity in this field today and in the future. This is true generally throughout the nation in the general practice of dentistry and also in its specialties with one exception, and that is the practice of orthodontics in California.

California has the largest percentage of those doing exclusive practice of any of the states. With only 5.25 per cent of the total population, it has 14 per cent of the orthodontists. New York with 10 per cent of the population has 13.5 per cent of the orthodontists, and Illinois with 6 per cent of the population has 6 per cent of the orthodontists. Ohio with 5.25 per cent of the population has 5.2 per cent of the orthodontists, and Texas with 5 per cent of the population has 4.5 per cent of the orthodontists. Pennsylvania with 7.5 per cent of the population has only 4.6 per cent of the orthodontists, and Oregon with 0.8 per cent of the population has only 0.6 per cent of the orthodontists. Washington with 1.3 per cent of the population has only 1.7 per cent of the orthodontists.

Pennsylvania has 230,200 people to each man in practice. Ohio has 143,900; Illinois, 136,100; Texas, 149,100; New York, 106,900; Oregon, 218,000; Washington 108,500; California, 52,300.

It is of interest to note that California has 5.25 per cent of the population and 8.75 per cent of the dentists. In 1939 there were 6,262 dentists practicing in the state with more than 1,100 people per dentist.

The increase in the number of orthodontists in the state has been very rapid within the last twenty years, and it does not seem to show any signs of abating. This society has taken into its membership twenty new men from this state since the last meeting.

The dental schools of California in undergraduate and graduate courses are training more and more students and dental practitioners in the fundamentals of orthodontics. Most of these students and practitioners are California men and will remain in California.

TABLE II

CITY	NO. OF PEOPLE PER ORTHODONTIST
San Diego	50,500
Long Beach	54,500
Los Angeles	37,400
San Francisco	27,400
Stockton	27,250
East Bay	26,400
Sacramento	21,100
Fresno	20,200
San Jose	17,700
Pasadena	13,600
Santa Monica	13,200
Palo Alto	5,600
Portland, Ore.	77,000
Seattle, Wash.	37,000
Spokane, Wash.	122,500
Tacoma, Wash.	35,800

It would seem, from the study of statistics, that the saturation point has pretty well been reached and that, if the present rate of increase is maintained, the specialty of orthodontics will be very much overmanned within a few years.

It is true that the last decade has seen an increase in population of 1,230,136, but, according to the statistics available, this increase is of little value to our profession. A great percentage or all of this increase has been due to a migration of persons from the dust bowls, and these people are not economically situated to become our patients. The birth rate of California is about the average for the United States. The primary schools in many localities are showing sharp declines in attendance to such an extent that the authorities are being careful about the number of new teachers employed. Neither of these conditions looks hopeful for the orthodontist.

It is much easier to stop this trend now than to try to correct it at a later date. There seem to be only two possibilities for the correction of this condition. The first is to make treatment available to more patients through state aid or other charitable sources or by the lowering of orthodontic fees, at least for certain classes, or a combination of both. The second possibility would be to explain this condition to the dental profession and the schools of the state and ask for their cooperation.

Should our profession become overcrowded, it will experience all the ills seen by other professions under similar conditions.

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## THE IMPLANTATION OF BONE IN THE CHIN IN A SEVERE CASE OF MANDIBULAR RETRACTION

### CASE REPORT

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THIS report was selected because of the value it might have in the field of therapy.

*History.*—The patient, a boy 14 years of age, presented an extreme dento-facial deformity involving the development of the chin. He was an only child. His father and mother presented normally developed faces. His health was good. He had had no serious illness. The cause of the anomaly was unknown.

*Diagnosis.*—Photographic facial reproductions, gnathostatic plaster denture reproductions, and graphs of the gnathostatic plaster denture reproductions were made (Fig. 1). Roentgenographic examinations (Fig. 2) were taken. An appraisal of the material showed the anomaly in relation to the:

A. Raphe Median Plane (relation of the lateral halves of the denture to the median plane), involves in the maxillary arch a total dental contraction, mild and asymmetrical, and in the mandibular arch a total dental contraction, mild and asymmetrical. The figures comparing the width between the molars and the premolars to Pont's normal are (Fig. 1):

Distance between $\overline{4}$ and $\overline{4}$	—	38 mm.
Distance between $\overline{6}$ and $\overline{6}$	—	49 mm.
Distance between $\overline{6}$ and $\overline{6}$	—	49.5 mm.
Distance between $\overline{4}$ and $\overline{4}$	—	38 mm.

B. Orbital Plane reveals, both in the facial reproduction (Fig. 1) and the denture reproduction, in the maxillary arch an anterior dental protrusion of a medium degree (5 mm.) as revealed by the position of the prosthion on the denture as well as the position of the cheilon in the facial reproduction. The denture reproduction shows a mild retraction of the lateral segment. In the mandibular arch an extreme total mandibular retraction obtains.

C. Eye-Ear Plane, involves in the maxillary arch a normal development. In the mandibular arch a total mandibular attraction exists due to the mandibular retraction (Fig. 1).

*Therapy Employed.*—The therapy was first mechanical and later surgical. At the time of consultation it was explained to the parents that due to age and to the extreme mandibular retraction the possibility of obtaining mandibular development through mechanical means was rather limited and that if it was deemed necessary to obtain further change it could be accomplished by means of surgery (the implantation of bone in the chin). This therapeutic approach

to the problem met with favor with the parents and the patient, and the mechanotherapy was immediately instituted and continued for a period of twenty months. This consisted of the use of a maxillary appliance and a

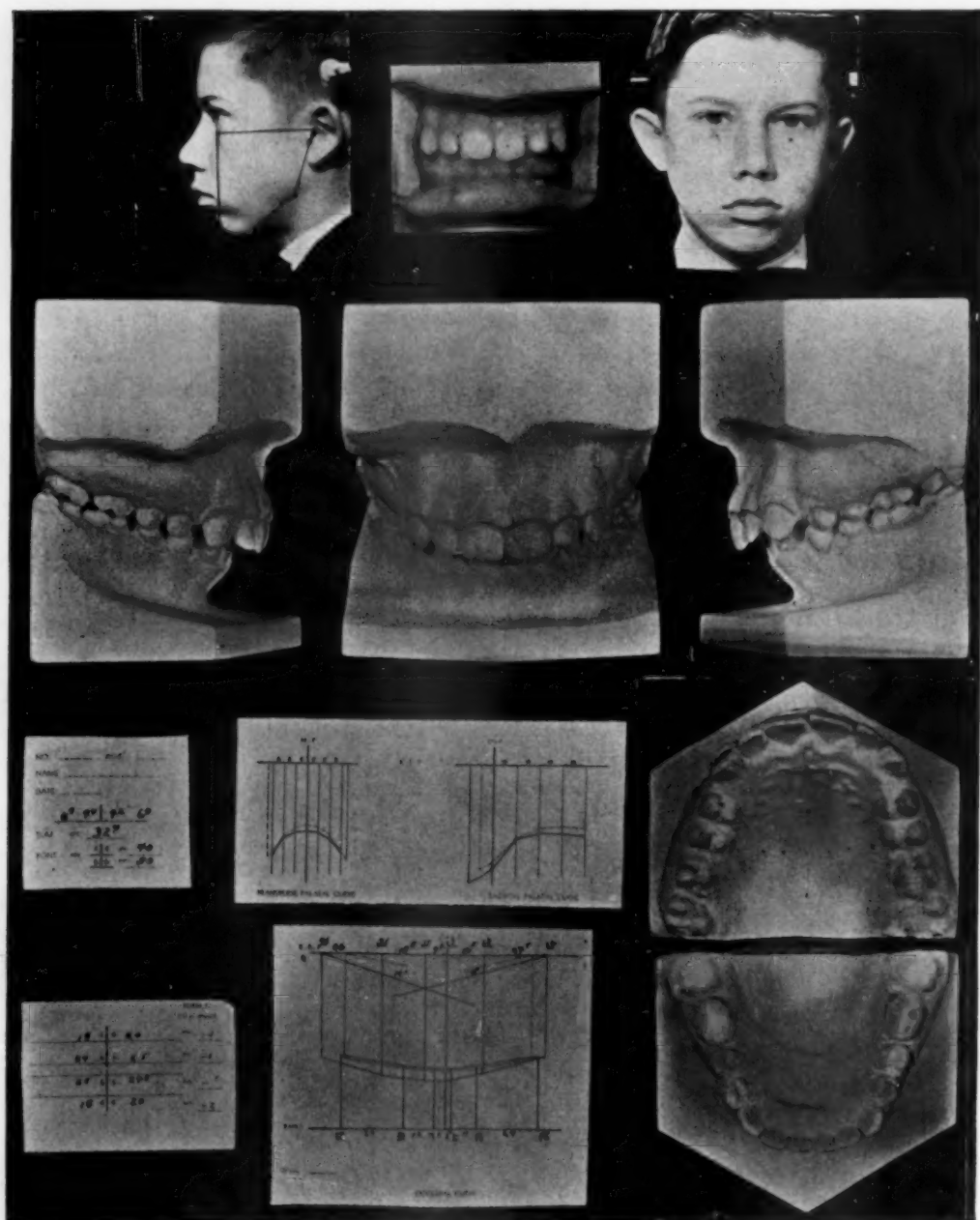


Fig. 1.

mandibular appliance. Intermaxillary elastics were used for a period of six months. After all appliances were removed a mandibular and maxillary retainer was placed and myotherapy was employed.

*Maxillary Appliance.*—The maxillary appliance (Fig. 3) consisted of anchor bands of 0.007 inch in thickness and 0.018 inch in width, fitted on the maxillary

first permanent molars. Rectangular tubes were soldered to the buccal surface. The incisors, canines, and premolars were banded, 430 x a ribbon bracket bands being used. The object of the treatment was to move the anterior teeth posteriorly and the lateral segments forward. This was accomplished by pitting the lateral segment against the posterior segments and was also aided by the use of intermaxillary elastics.



Fig. 2.

*Mandibular Appliance.*—The mandibular appliance (Fig. 3) consisted of anchor bands of 0.007 inch in thickness and 0.018 inch in width fitted on the mandibular first permanent molars. 430 x a bracket bands were placed on

the incisors, canines, and premolars. The object of the treatment was to obtain as much forward movement of the mandible as possible. This was obtained by the use of intermaxillary elastics. At the end of twenty months all bands and appliances were removed. Retaining appliances of the Hawley type were constructed. At the end of three years the patient insisted upon having the surgery performed.

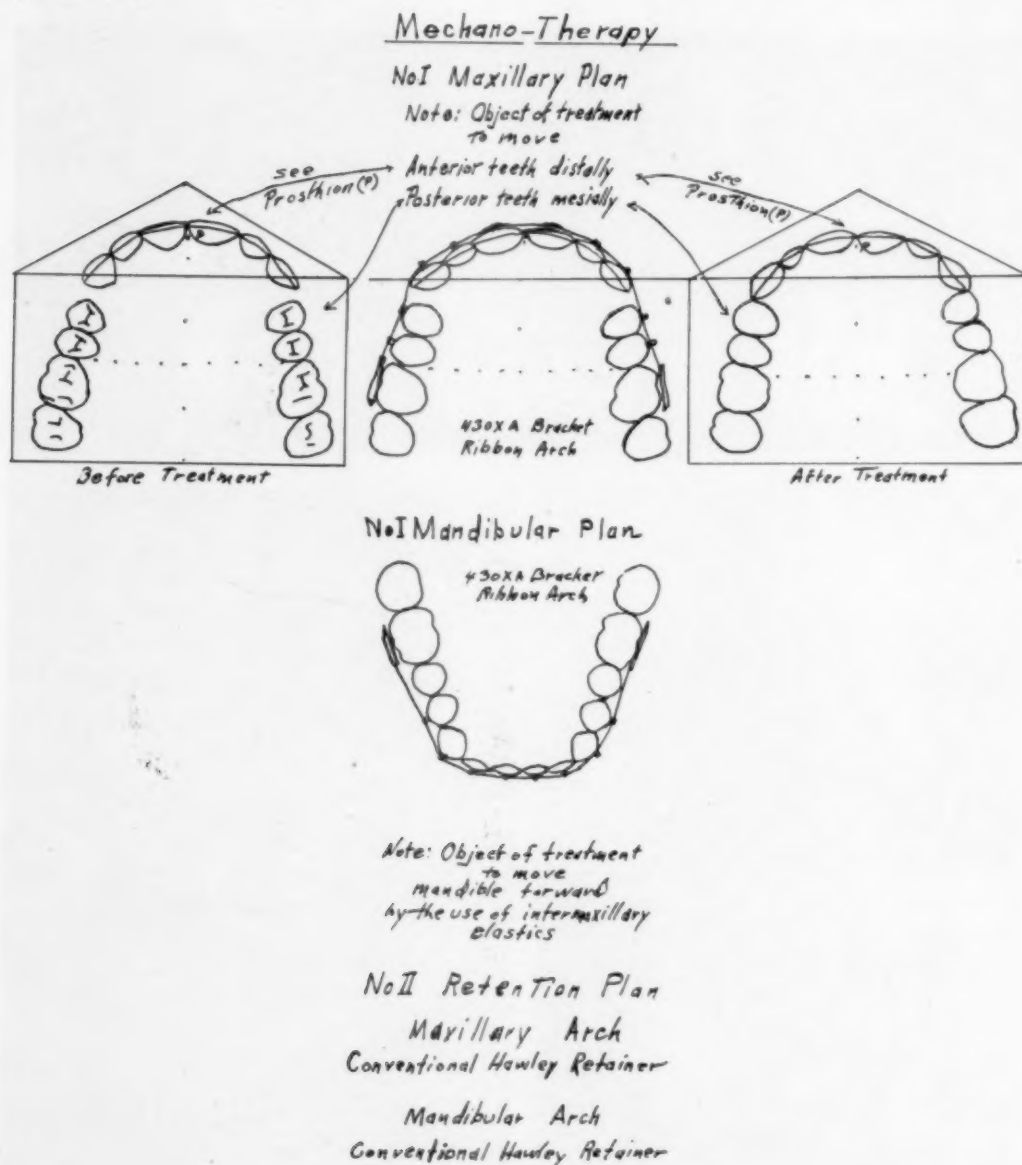


FIG. 3.

**Surgicotherapy.**—The surgical report is that of the facial surgeon, Dr. Albert Davis, whose report will be found at the conclusion of this paper.

**Results Achieved.**—The examination was made in September, 1935. The active period of treatment was twenty months. The retention period lasted two years. At the end of that time photographic facial reproductions, gnathostatic plaster denture reproductions, and graphs of the gnathostatic plaster denture



reproductions were made (Fig. 4). The change in occlusion of the teeth approached the normal; however, the growth of the mandible was very little as indicated in our prognosis at the time of consultation with the parents. The surgery was performed this last summer. Photographs were taken three months later (Fig. 5C). The favorable change in the facial expression is discernible.

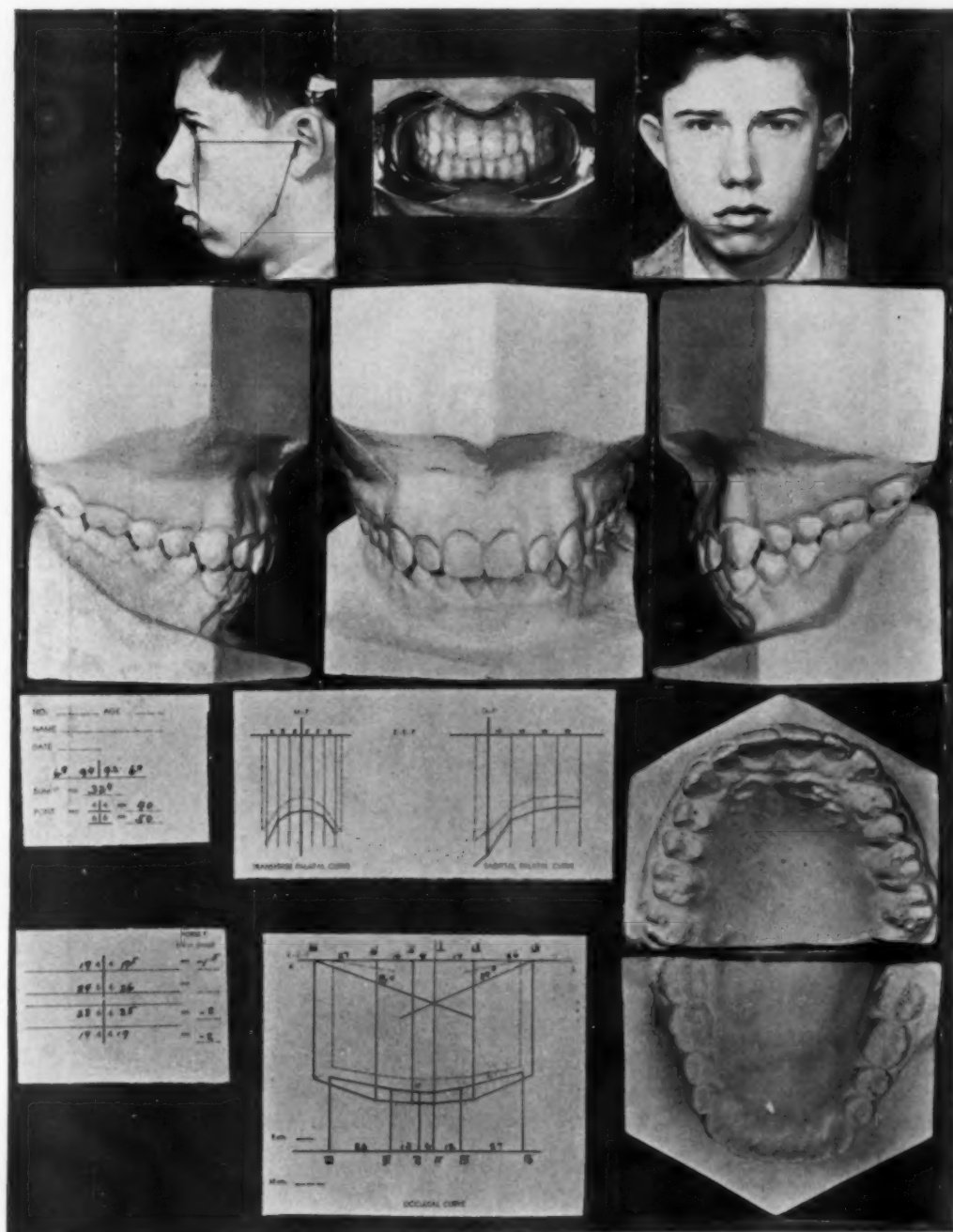


Fig. 4.

*Prognosis.*—As mentioned under therapy the prognosis in regard to development of the chin was unfavorable unless surgery was performed. Con-

cerning the correction of the occlusion and the retention thereof the prognosis was favorable.

*Observation and Conclusion.*—An interesting and valuable observation is the comparison of data collected before treatment (Fig. 5A) and after treatment (Fig. 5C). Further observation and additional data may be obtained in the future if conditions permit.

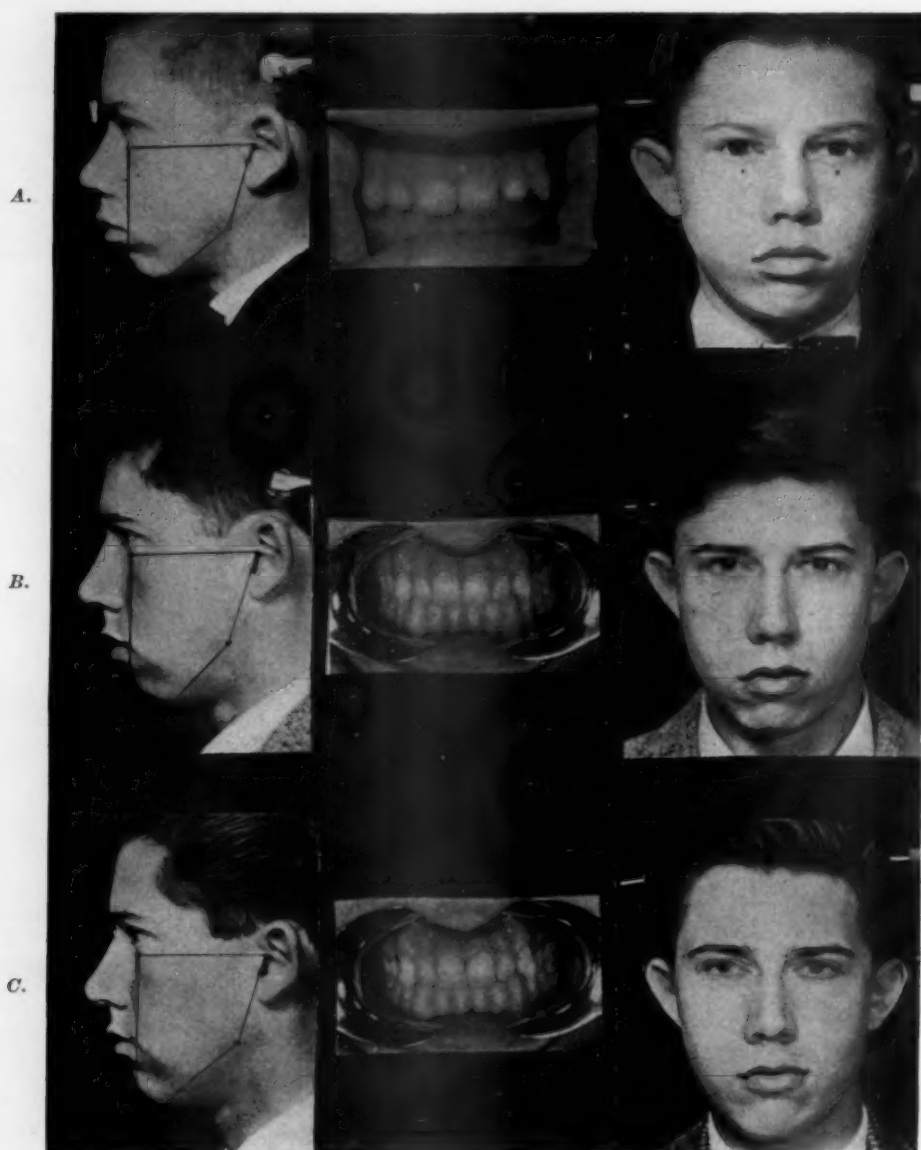


Fig. 5.

*Surgicotherapeutic Report*, Dr. Albert Davis, San Francisco.—J. M., patient with retruded chin, referred by Dr. Earl Lussier. Orthodontic mechanotherapy completed.

A wax mold was shaped and contoured to size desired. At operation, under intratracheal anesthesia, a transverse incision approximately four inches long

was made about an inch below the lower border of the mandible. The incision line was placed as nearly as possible in an area where the resultant scar will rarely be seen. Careful dissection was made down to the bone until a pocket was formed for the reception of the graft. All bleeding vessels were tied with care to prevent hematoma. The right iliac crest was selected for the graft which was taken in the usual manner and shaped by the use of files, ronguers, and chisels until it approximated the pattern previously made. Holes were drilled through the graft after proper fitting and extended through the underlying bone. Chromic catgut was threaded through and securely tied. The soft tissues were then brought over the implant and sutured. External pressure was applied to further prevent collection of serum and guard against movement of the graft. Stitches were removed on the seventh day and a collodion splint applied. The wounds healed with little reaction except a small fistula where a drain was placed in the iliac crest wound. This cleared up in a short time, and patient was dismissed.

#### COMMENTS

Retarded mandibles vary in character. They may be unilateral or bilateral and are usually accompanied by malocclusion. In all cases recession of the chin is most conspicuous. New and Erich<sup>1</sup> classify these deformities into three divisions:

1. Those due to malocclusion.
2. Those due to arrested growth of the mandible with secondary malocclusion.
3. Receding chins not associated with malocclusion.

Since the dentition itself controls to a great extent the mandibular contour, it is reasonable to assume that mandibular changes occur during the entire time of the eruption, growth, and position of the teeth and continue to change if the teeth are lost. If, during the developmental period and until dentition is complete, any factor intervenes to prevent normal eruption, position, or growth of teeth malocclusion occurs and may result in some abnormality in the contour of the mandible. Changes in contour of the jaw in turn affect the overlying tissues and the deformity may increase year by year.

When micrognathia can be recognized in the first weeks of life, correction should be started as early as possible. Long before the advanced calcification of the bone occurs, and prior to the eruption of the teeth, the jaws may be molded by pressure or muscular development. This molding process is demonstrated in clefts of the palate extending through the alveolar ridge. In early cases the cleft may be molded either by manual pressure or by the traction of the orbicularis oris after closure of the lip. In micrognathia, Davis and Dunn<sup>2</sup> demonstrate a mechanical nursing bottle which lessens the deformity greatly until the case may be turned over to the orthodontist.

Probably the better known forms of jaw deformities are seen in certain dogs, such as the Abacus type of Pekinese and the Pug in which both jaws are affected. Another form of shortening of the mandible occurs in sheep. This defect is known among the shepherds as "hog-jaw" and the animal so affected can

neither suckle nor graze. Many extreme forms of this type of deformity are reported, and the Museum of the Royal College of Surgeons shows several specimens.

In our case, the deformity was probably due to some early arrest in developmental factors with subsequent malocclusion.

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### **Physical Fitness in Terms of Physique, Development and Basal Metabolism:**

By N. C. Wetzel, M. D., *J. A. M. A.* 116: March 21, 1941.

Wetzel has devised a method of determining physical fitness with regard to body build, development, nutrition, physical status, age advancement and maturation by a new use of the usual measurements of age, height and weight of children which are plotted in what he terms the "grid" or "channel system."

Wetzel has shown that healthy children tend to develop along given channels or "preferred paths," without undergoing alteration of physique or departing significantly from their own age schedules of development. This method enables us to determine whether a child is in a channel which indicates that he is making normal growth progress. Wetzel's method was found to be 94 per cent reliable in tests on several thousand Cleveland school children. Although the grid method can be used to determine subnormal physical fitness it should not be used to diagnose specific systemic disease. That must be done by the physician in the usual manner.

*Grid Technique of Evaluating Physical Fitness.*—The chief principle underlying Wetzel's grid technique is that it provides a simple, objective method for evaluating physical fitness, and considers the individual child in relation to his own past record of developmental progress. It can be used as a guide in determining the individual progress of the child throughout the entire range from infancy well into maturity. Measurements on weight, height and age of the child are obtained in the usual way and entered according to directions of the grid designed by Wetzel. From a point so plotted, or from several plotted points, representing successive observations, it is immediately possible to elicit the following quantitative information which makes up the items entering into the "Grid Evaluation of Physical Fitness:"

1. Physique (body build).
2. Developmental level.
3. Nutritional grade.
4. Physical status.
5. Relative age advancement or retardation.
6. Maturation.
7. Basal heat production.
8. Daily caloric intake.

The first five items in the foregoing list are sufficient for an objective rating of physical fitness. The grid enables the examiner to measure and consider each of the items separately or in any desired combination.

The grid itself consists of seven principal channels of physique, designated  $A_3$ ,  $A_2$ ,  $A_1$ , M,  $B_1$ ,  $B_2$ ,  $B_3$ . The channels traverse the field diagonally and are graduated in metric, and the customary units of weight and height. The distance along the channels is subdivided equally by parallel isodevelopmental level lines.

The M channel is the median channel; the A channels are those above the middle, while the B channels are below the middle channel. The point at which height and weight are plotted will fall into a specific channel and will stay in that channel as the child grows and develops. Normal variations do not exceed one-half channel per 10 units of advancement. If the change is greater, there is cause for thorough physical examination and investigation of the child by the physician.

GRID RATINGS OF PHYSICAL STATUS CORRESPONDING TO LOCATION OF POINTS IN VARIOUS CHANNELS

PHYSICAL STATUS	CHANNEL	PER CENT OF 2,093 CASES AT DEVELOPMENTAL LEVEL = 100 AND ECONOMIC TENTH = 3.4
Obese (O)	$A_4$ , $A_5$	6.8
Stocky (S)	$A_3$ , $A_2$	9.4
Good (G)	$A_1$ , M, $B_1$	61.6
Fair (F)	$B_2$	13.9
Borderline (B)	$B_3$	5.9
Poor (P)	$B_4$	2.4

The supplementary charts in the right hand panel contain five representative or standard curves of developmental progress called *auxodromes* by Wetzel, meaning growth courses, which show how far the physically advanced, normal or retarded child may be expected to develop at a given age. The average rate of progress according to these schedules, is approximately one level line a month. Values much greater or less are unsatisfactory, even if development is proceeding strictly within the given channel slope. A scale has been added aligning heat production and caloric intake to developmental levels.

*Paths of Changing Physique.*—Cross channel advancement upward and to the left leads to obesity, while downward and to the right foreshadows oncoming "malnutrition." With a change in the channel, there comes also a change in physique which is indicated on the grid by the projection of the curve of development established by successive examinations.

*Developmental Level Measurement.*—The isodevelopmental level lines which subdivide the channels into equally spaced units (each ten units are shown by a solid line and each five units by a broken line) are used in measuring physical development. Regardless of the channel in which the height-weight of the child appears, the state of development is the same if it appears in the same developmental level. Thus, development may be measured independently of physique.

*Nutritional Grade.*—Optimum nutrition is defined by Wetzel as the sum total of those processes which together enable development to proceed along the contour lines of one's inherited physique. The normal or optimum nutrition

in the clinical sense is indicated whenever the slope of a given child's curve is within his own channel, provided the progress of growth proceeds along a satisfactory time schedule.

When the slope of growth departs from the channel toward the A channels, a change in physique toward obesity is indicated which may be due to nutritional or endocrine origin. If the change is toward the B channels, it may indicate defective diet, dental caries, diseased tonsils and adenoids, fatigue, poor hygiene or other deficiency.

A curve of development which shows significant departure from the chosen channel slope, indicates simultaneous changes in (a) nutritional grade and (b) body build. At the same time, the rate of projection of the curve on the channel axis is the measure of coincident change in body build.

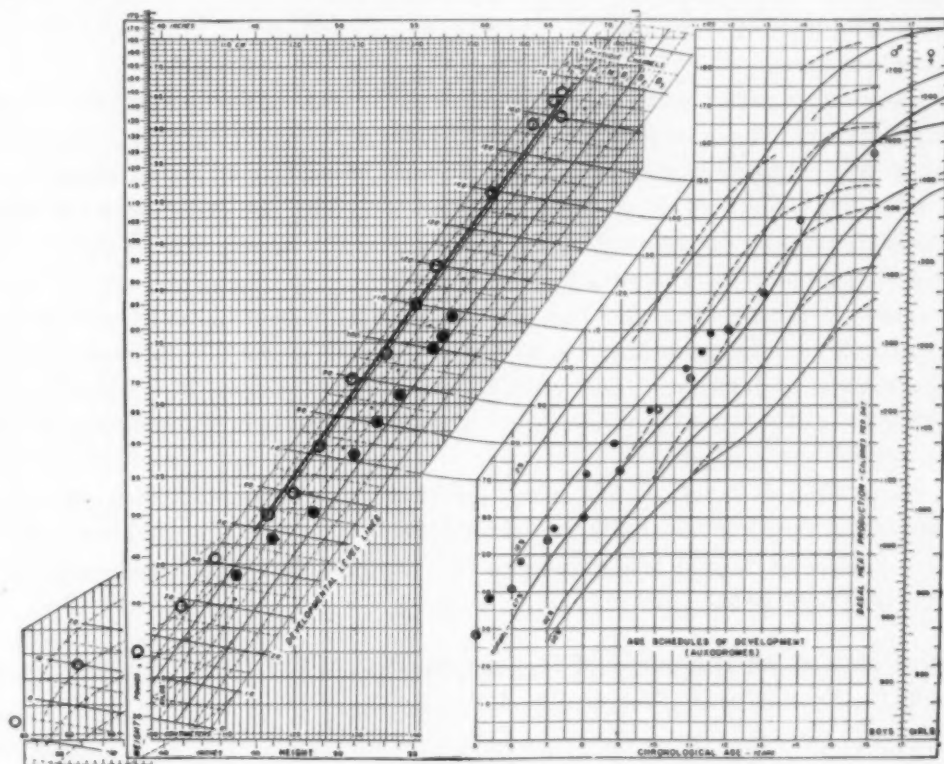


Fig. 1.

*Physical Status.*—"Physique" refers to body build and is one of the items required to define physical status. The latter is the resultant physical state produced by the combined effects of growth, development and nutrition. Every height-weight point in the grid field can be associated with nutritional level, since stocky children will appear in higher A channels and underweight children in lower B channels, and the combined information will give a graphic estimate of the physical status at a given point. However, significant information on physical status, whether a child is gaining or losing, requires a knowledge of its past history, more than one height-weight point must be obtained and the direction of the line thus projected must be taken into consideration.

*Relative Age Advancement or Retardation.*—The auxodromes in the right hand panel show how physical development proceeds with respect to age. When plotting a height-weight point in the grid, the corresponding developmental level is obtained and is in turn plotted in the curve of the panel to the right at the subject's chronologic age. Thus the patient's auxodrome may be established by several observations at different age intervals. When an auxodrome falls behind a year or more, it may be a sign of physical deficiency, but should not be used as a diagnostic measure of some specific condition. This must be established by the physician.

*Developmental Age.*—This may be obtained by taking height and weight and plotting on the physique channel and by reading the age at which 67 per cent norm intersects the developmental level, indicated by the plotted height-weight point and comparing with the actual chronologic age of the child. The developmental age may be in advance or retarded in comparison to chronologic age.

*Maturation.*—The auxodrome established by the child indicates the rate of maturation. Those in the advanced auxodromes tend to mature earlier than those in the retarded auxodromes, with puberty occurring at about a mean age of 13.6 years. Maturation of both boys and girls may be expected when their individual auxodromes show the greatest curvature which thus indicates the time of maximum deceleration of development.

*Basal Heat Production.*—The new standards of basal heat production on the right side of the scale have been aligned directly to the developmental levels showing the standard basal heat production. Thus, the clinical distinction can be made between normal and abnormal states of metabolism according to the developmental level of the child.

*Daily Caloric Intake.*—The scales for basal heat production also serve as a guide for estimating the daily caloric intake. To obtain the maximum daily caloric intake at any developmental level, the corresponding basal heat value is multiplied by two.

**Recent Studies on Diagnosis of Hypothyroidism in Children:** By L. Wilkins, M.D., *Pennsylvania Med. J.* 44: 429, January, 1941.

The rate of growth in children with hypothyroidism is always slowed, the size of the child depending on how early in life the deficiency began. The ratio between the upper and lower skeletal segments changes during childhood because of a more rapid growth of the lower segment. In the hypothyroid dwarf the ratio remains that of a younger child, corresponding to his height rather than his age. Dwarfs who are not hypothyroid usually attain ratios normal for their actual age. In hypothyroidism the nasal structures fail to develop normally, and if the deficiency dates from early childhood the nas-orbital configuration remains infantile; the nose is short and the nasal bridge broad and flat. Ossification of the cartilaginous centers is delayed, and the treatment with thyroid accelerates the rate. Osseous development can be followed during treatment, and whether the dosage given is sufficient to cause a normal level of development can be determined. Endochondral ossification is



not controlled by thyroid alone, and a diagnosis of hypothyroidism should not be based entirely on delayed ossification. Many dwarfs with no evidence of thyroid insufficiency who fail to respond to therapy show as advanced degrees of osseous retardation as do hypothyroid patients.

Dentition is always delayed, and the teeth formed during thyroid deficiency are structurally defective and decay early. Epiphyseal dysgenesis, causing abnormalities in subsequent ossification, occurs. Ossification arises in multiple areas. As these enlarge and coalesce, they appear on roentgen study as stippled, porous or fragmented. A pale grayish color of the cheeks and lips and circulatory mottling of the skin are evidences of decreased peripheral circulation and are encountered regularly.

**Tongue-Tie in Infants and Children:** By Eugene T. McEnery, M.D., and Frances Perlowski Gaines, *J. Pediatrics* 18: 252, 1941.

In observing a large series of newborn babies, the authors have never seen a tongue that had to be clipped. Nursing technique does not require that the short frenum be cut, and because of the dangers associated with this so-called simple operation, they advise against it.

Tongue-tie (ankyloglossia) arises from a thickening of the geniohyoglossus muscles meeting in the midline of the tongue where they are elevated into a distinct vertical fold called the frenum linguae. The latter unites the tip of the tongue to the floor of the mouth and the posterior lingual surface of the gum. Since the tongue is always short at birth, it is not always easy to determine how much the frenum interferes with its movement. In the newborn infant the tip of the tongue is as yet incompletely developed, and the frenum may normally be well forward. As the infant grows, the tongue becomes longer and thinner toward the tip.

In the newborn infant, tongue-tie presents only a minor difficulty in nursing, either in taking the breast or bottle. In taking the bottle there should be no trouble. In regard to the breast, especially if the nipple is short or retracted, there may be some difficulty, but this can be corrected by gentle massage of the mother's nipple, not after she has been delivered but in the last month of gestation.

Tongue-tie is one of the most frequently advanced explanations for the etiology of defective articulation. The tongue is a very mobile, muscular organ capable of undergoing great changes in length and width at every contraction of its muscles, and in this very capacity for change lies its great range of adjustability and compensation. With growth, the tongue undergoes considerable elongation.

Considerable forethought should be given before this operation is performed, especially when it is delegated to an inexperienced person. There is a possibility of a subsequent infection at the base of the tongue, with the formation of a large ulcer and a spreading stomatitis which make it difficult to feed the baby, resulting in severe dehydration and weight loss. When this ulcer at the base of the tongue heals, it often leaves a large scar tissue which makes

for marked immobilization of the tongue. Severe hemorrhage has also been reported. Cases have been reported in which, after the frenum was cut, the tongue became too movable and was swallowed, followed by resultant attacks of asphyxia.

Since the speech clinician sees children with speech disorders after they have reached the age of 4 or 5 years, the actual presence of a short frenum in these children is rare. It can be reasonably presumed, therefore, that this factor plays a minor role as a causative factor in the etiology of defects of speech. The upward lift of the apex of the tongue is utilized in the formation of the consonants T, D, L, N, and R. If the frenum extends too far forward toward the tip of the tongue, it interferes with the upward lift of the apex. In the formation of T and D, the tongue apex occludes against the upper alveolar ridge, preventing the escape of air. Upon sudden release, the resultant explosion produces the acoustic effect of T and D. In the formation of N, the tongue is raised to the hard palate and the vibrated air is driven out past the relaxed velum through the nose. However, in the formation of L there occurs not only the raising and approximation of the tip of the tongue to the alveolar ridge, but likewise a contraction of the margins of the tongue, allowing the vibrated air to spill out of both sides of the tongue simultaneously. In the formation of the initial R sound, the tongue should be raised and left free to vibrate, the sides touching the upper teeth. When tongue-tie does occur, it should, therefore, logically interfere with the production of the above-named consonants; yet this has not been the result in the cases observed. Compensatory adjustments of the highly mobile organ result in adequate and intelligible speech.

Until, or unless, a definite cause-and-effect relationship between disorders of articulation and tongue-tie can be established, operation is usually contraindicated.

If surgery is resorted to, it is necessary for the surgeon to bear in mind two factors: first, the necessity of preventing adhesion by daily dressings following the clipping; and, second, the habit formation which has been going on ever since the child began to talk. The postoperative care is primarily the surgeon's problem, but it is his further duty to explain to the parents the necessity of speech re-education. The child's erroneous auditory motor conception of the production of consonants must be revised to assure perfect functioning. The presence of a shortened frenum is no proof that it is the etiologic factor responsible for the deviation of speech.

**The Pharmacological Basis of Therapeutics: A Textbook of Pharmacology, Toxicology and Therapeutics for Physicians and Medical Students:** By Louis Goodman, M.A., M.D., Assistant Professor of Pharmacology and Toxicology, Yale University School of Medicine, and Alfred Gilman, Ph.D., Assistant Professor of Pharmacology and Toxicology, Yale University School of Medicine. Pp. 1383. Price \$12.50. New York, The Macmillan Co., 1941.

The authors approach the study of pharmacology and therapeutics through a correlation of basic physiologic principles with pharmacodynamics and the

pathologic physiology of disease with the action and uses of drugs. The dentist will appreciate the clinical applicability of the basic principles and therapeutic procedures stressed in this work.

Prescription writing, an art in which dentists are as a rule lacking, is here presented in detail. The prescription is here looked upon as a summary of the diagnosis, prognosis, and treatment of the patient's illness, as the ultimate step in the application of pharmacology to clinical medicine and the restoration of the patient's health. Tables of weights and measures and specimen prescriptions are provided and explained in detail, as are the commonly used abbreviations and Latin phrases.

The vitamins are discussed from the standpoint of deficiency symptoms, pharmacologic action and human requirements. A chapter is devoted to drugs which act locally on the skin and mucous membranes.

Dentists will be especially interested in the chapters dealing with anesthetics. The respective roles of Horace Wells and W. T. G. Morton, in the introduction of general anesthesia for surgical operations, are presented in a manner which bids fair to satisfy the adherents of both men. The stages of anesthesia are explained as are the various anesthetics now available and in more or less common use, such as ether, chloroform, divinyl ether, ethyl chloride and trechlor ethylene. A special chapter is devoted to nitrous oxide, ethylene, cyclopropane and acetylene. Lest dentists be lulled to a false sense of security in their use of nitrous oxide for dental operations, we quote the following:

"*Cerebral asphyxia* may result in irreversible cortical damage if prolonged beyond the limit of tolerance of the nerve cells for anoxia. . . . Nitrous oxide is the worst offender because it often necessitates limitation of oxygen." At the same time, the authors point out that many deaths have been unjustly attributed to anesthetics. A careful selection of patients is urged. One hundred and twenty-six figures and sixty-seven tables are included. The book has a good index.

## Editorial

### The Journal of the A. D. A. and "Mail Order" Orthodontics

Propaganda may appear inadvertently in a scientific journal as elsewhere. Without extreme caution in the selection of manuscript, quirks advocating some particular scheme that is unorthodox in treatment may evade the scrutiny of painstaking editorial policy. Propaganda of any kind is unique in that it usually feeds on false premise, but even though it be part truth and part false it can sometimes be made to appear logical when in reality it may be nothing more than the whim of an individual running exactly counter clockwise to accepted and proved practice. One thing, at least, is certain, such propaganda always attracts the spot light. This seems to be the status of the interesting suggestions for professional service in orthodontics gleaned from page 605 of the *Journal of the American Dental Association*, April, 1941, in an article entitled "The Orthodontic Problem" by Edwin J. Blass, D.D.S. The writer refers to what is generally known as "mail order orthodontic treatment" and goes on to say: "Try this simple formula: For your first step, accept a case that appears not too complicated. Then submit models of the arches together with x-ray pictures of the complete mouth to a dental laboratory competent to accept such cases. They will advise you as to what to do step by step, and then construct the necessary appliances. If such initial efforts of yours are rewarded with some degree of success, which I have every reason to believe they will be, you will be spurred on to greater heights. Nothing but progress gained through study of books on the subject and postgraduate work will satisfy your ambition for a complete prosecution of this intensely worth-while service." The article in theme O.K.'s "mail order" orthodontics; however, equally as revealing in both purpose and motive is the quotation from another paragraph from the same article. "To the general practitioner who appreciates the tremendous need and has the desire and will to do, I suggest this field where the harvest is great and the workers are few."

The inferential translation of the above as propaganda for laboratories it seems might read something like this. "If you know nothing about the subject of orthodontics, Mr. Dentist, the answer to your limitation of ability is to call in a laboratory organization to diagnose your case, then go to work on somebody's child, then joyously hold your hat for the disgorge of the jack pot." Can a profession hope or dream of sincerity of purpose when manuscript reflecting such a hopeless amateurish concept of one of its important departments is broadcast widely in its official publication, and, inferentially at least, receives the blessing of official dentistry?

Why should unorthodox propaganda be spread pertaining to orthodontic treatment that would not be tolerated in any other department of dental practice, and in any other department would convulse the readers into its own oblivion.



Through the painstaking work of the committee on public information, of the American Association of Orthodontists, also through the efforts of the Southwestern Society of Orthodontists, the defects in this type of practice as advocated in the article referred to have long ago been exposed as harmful to both the patient and the dentist.

Through the efforts of Dr. Chas. R. Baker, Dr. Paul Spencer, Dr. T. W. Sorrels and others, the publisher of *Oral Hygiene* wrote as early as 1935 the following information. All advertising for orthodontic laboratory service effective after the appearance of the December, 1935, issue has been cancelled and it took only seven minutes to reach this decision after Dr. Spencer had sent the original correspondence with laboratories which diagnosed the cases and outlined the treatment for the dental profession. Orthodontists have long looked upon the "mail order" diagnosis and treatment methods as advocated by some dental laboratories as spurious and unfair to the calling and to childhood, and it is obvious that if such a type of treatment could be made successful they would be the first to adopt such treatment because it is a simple setup and convenient to put into execution. They view the treatment much in the same manner as the profession at large views the laboratory prosthetic process that suggests to the layman that he take an impression of his own mouth, send it to the laboratory, and by return mail he will receive a satisfactory denture, along with a bag of peanuts to try it out on.

There are two offsets to both of these setups advocated by certain laboratories: one is the statutes that have been enacted in some states that make such practice a violation of the law, the other is education. In the case of the orthodontic travesty, however, education is difficult to accomplish without the full cooperation and understanding of all dental periodicals.

Arguments on both sides of this time-worn subject were published in the *AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY* during 1936, page 90. They were published just subsequent to the time various dental journals agreed to discontinue the advertising of "mail order" diagnosis and treatment of malocclusion, because the journals as a result of the presentation of a great deal of evidence were convinced that such a practice is detrimental to the best interests of both the public and the dental profession. A dentist or physician should not permit a laboratory to diagnose and treat anything for him in his practice. The state board did not license him to practice, expecting him to have his diagnosis and treatment executed by a laboratory. To such cases in which the diagnosis is made and treatment actually directed by the mechanical laboratory, the state board of dental examiners should then reverse its order and issue license to practice to the laboratory, and ask the dentist to show cause why his license should not be revoked on the basis that he depends upon unlicensed talent to diagnose and direct treatment of his cases.

## In Memoriam

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### I. NORMAN BROOMELL

I. Norman Broomell, Dean of the Temple University School of Dentistry, died March 23, 1941, at his home in Germantown, Pa. He was one of the pioneers in the advancement of dental education.

Dr. Broomell was born in Chester County, Pa., on Nov. 25, 1858, and received his early schooling in the public schools. As a boy he worked in the machine shops of his father's firm, and there realized the skill he possessed in his hands. The desire to help others with this ability furthered his interest in dentistry and he entered the Pennsylvania College of Dental Surgery from which he was graduated in 1879.

Two years later he was appointed to the faculty of the College and in 1896 became chief instructor of the prosthetic department. In 1898 he was made Professor of Dental Anatomy, Dental Histology, and Prosthetic Techniques and remained in this capacity until 1906 when he joined the faculty of the Medico-Chirurgical College as Dean and Professor of his department. When the Medico-Chirurgical College was absorbed by the University of Pennsylvania, Dr. Broomell became a member of the dental faculty of Temple University to fill the newly created chair of Professor of Dental Anatomy and Clinical Dentistry. In 1918 he became Dean of the School of Dentistry.

Dr. Broomell was the author of a well-known text, *Anatomy and Histology of the Mouth and Teeth*, which is now in its sixth edition. He was one of the first to use lantern slides in his teaching. He was a member of dental and civic organizations in this country and abroad and had received several honorary degrees.

One of his chief interests was photography. He was never without his camera on his many travels and collected numerous films which he showed for the enjoyment of his friends.

Dr. Broomell was loved and honored by his colleagues and students. The Journal pays tribute to this admirable man.

## News and Notes

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### Dr. F. S. McKay Retires

Of interest to the readers of the JOURNAL is the retirement from practice of Dr. Frederick S. McKay, who was among the very early practitioners of orthodontics in America.

Dr. McKay practiced orthodontics as a specialty in the City of St. Louis, later in Colorado Springs, Colo., and at a subsequent time he moved to New York City. He was a member of the class of 1903 of the Angle School in St. Louis and returned to St. Louis to be associated with Dr. Angle in the School during the sessions of 1905-6-7.

In 1917 he relinquished the practice of orthodontics and since that time, and up to his retirement, was associated with the late Dr. Wm. D. Tracy in New York in the practice of periodontics.

Dr. McKay did much of the original research on the so-called mottled teeth, or the brown-stained teeth of Colorado Springs and other localized spots in America. His work on this subject made a valuable contribution to childhood and the scientific advancement of dentistry.

Dr. McKay is now located at 624 North Cascade Avenue, Colorado Springs, Colo.

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### Orthodontists Receive Honorary Degrees

At its seventy-fifth anniversary meeting held in St. Louis, Mo., on April 9, 1941, Washington University conferred honorary degrees upon dentists. Three of these degrees were conferred upon well-known orthodontists in appreciation of their outstanding contributions to the advance of the profession of dentistry.

The orthodontists who received these degrees were Brigadier General Leigh C. Fairbank, head of the Dental Corps of the United States Army, Dr. Alfred P. Rogers, head of the Graduate Orthodontic School of Harvard University, and Dr. E. C. Willett of Peoria, Ill., painstaking worker in the field of children's dentistry. In addition to the orthodontists receiving degrees were: Dr. Hermann Prinz, University of Pennsylvania, Dr. Philip Jay, University of Michigan, Dr. Isaac Schour, University of Illinois, and Dr. Paul Kitchin, Ohio State University.

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### Western Reserve Dental Alumni Association

The Western Reserve Dental Alumni Association announces its annual alumni day at the School of Dentistry, Monday, June 9, 1941. Dinner and class reunion will be held at the Mid-Day Club at 6:30 P.M.

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### Southern Society of Orthodontists

The next meeting of the Southern Society of Orthodontists will be held in Raleigh, N. C., Sept. 29 and 30, 1941.

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### Mexican Orthodontists Association

The Third Medico-Dental Convention will be held in Mexico City, June 23 to 28, organized by the Mexican Orthodontists Association, at the School of Dentistry, of the National University of Mexico.

Dr. S. Fastlicht, Secretary  
Madero 40, Mexico City, Mexico

### The Dental Students' Register

The series of statistical tables issued annually by the Council on Dental Education under the caption of the Dental Students' Register presents evidence of interesting trends in dental education and licensure. The several tables are compiled as of Oct. 15, 1940.

Table I, dealing with enrollment in the thirty-nine dental schools in the United States, shows the following enrollments in different groups; undergraduates in the regular four-year course, 7,720; specials, 25; graduate students enrolled in courses leading to an advanced degree, 101; postgraduates enrolled in special courses not leading to an advanced degree, 149; dental hygiene students, 316. The grand total is 8,311, of which 7,902 are men and 409 are women. The women are distributed as follows: in the regular four-year course, 88; in dental hygiene, 316; in special courses, 5. The undergraduate enrollment by classes stands as follows: first year, 2,305; second year, 1,973; third year, 1,841; fourth year, 1,601.

Table II shows a recapitulation of the undergraduate enrollment since 1932 with a gain of 212 over 1932 and a gain of 313 over 1939. Present enrollments per school vary from 41 to 551, with an average of 198.

Table III deals with the predental college training of the 7,720 undergraduates enrolled in regular course. Only 82 of the entire enrollment had less than two years of predental college training and they are holdovers who entered dental schools before the present two-year requirement became generally effective. The predental training of the remaining 7,138 stands as follows: 2 years, 3,875; 3 years, 1,338; 4 years without a bachelor's degree, 223; with a bachelor's degree, 2,090; with other degree, 112. Thus almost half of the entire enrollment entered upon dental study with three or more years of liberal arts college training. This table also shows separate data for the first year students entering dental schools in September, 1940. There were 2,305 such students with predental training as follows: 2 years, 1,201; 3 years, 421; 4 years without a bachelor's degree, 64; with a bachelor's degree, 601; with other degree, 18.

Table IV gives the predental college training of the 1,757 students who graduated from the thirty-nine dental schools in the United States in the year ending July 1, 1940, as follows: with less than 2 years, 438; with 2 years, 609; with 3 years, 223; with 4 years without a bachelor's degree, 42; with a bachelor's degree, 394; with other degree, 51.

Table V gives the record of graduates with predental college training of the bachelor's degree or beyond from 1935 to 1940, inclusive. There were 320 in 1935 and 445 in 1940.

Table VI shows the distribution of the 7,720 undergraduates enrolled in the thirty-nine dental schools of the United States by the states, territories and foreign countries from which they come. There are students from every state in the Union, ranging from 5 from Nevada to 1,804 from New York. Of the 1,804 from New York, 847 are enrolled in the three dental schools in the State of New York and 957 are enrolled in dental schools outside of the state. There are 72 students from U. S. possessions, 34 from Canada and 80 from other foreign countries.

Table VII gives data concerning the 2,400 teachers in the thirty-nine dental schools in the United States. Of this number 641 are engaged on full time and 1,759 on part time. In the total number, 711 hold a bachelor's degree, 307 a master's degree and 222 the degree of doctor of philosophy and 240 some other academic degree. The professional degree of M.D. is held by 424 and the D.D.S. or D.M.D. by 1,797. Of the 1,797 who hold a dental degree, 1,410 are teaching in the dental school from which they graduated and 387 in other schools.

Table VIII shows the tuition and fee charges year by year in each school and the opening and closing dates of the academic year. The range of such charges for the full course runs from \$726 to \$2,224.

Table IX shows the number enrolled in the first year classes in the thirty-nine dental schools of the United States as of Oct. 15, 1940, the number accepted who did not matriculate and the number rejected.



Table X presents the results of dental licensing examinations by the forty-nine licensing boards in the United States for the calendar year 1939. This table shows that 2,744 were examined, 2,196 were passed and 548 or 20 per cent were failed. Seven state boards passed all applicants and fifteen boards failed 30 per cent or more.

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### Denver Summer Seminar

The sixth annual meeting of the Denver Summer Seminar for the study of orthodontics is to be held at the University of Colorado School of Medicine, July 28 to Aug. 2, inclusive. In accordance with Seminar policy to broaden the scope of the meeting and to include new leaders and material, Charles H. Tweed of Tucson, Ariz., and Isaac Schour of the University of Illinois will appear on the program for the first time this year. A prospectus outlining in detail the course of study for the coming meeting will be available in March to all who have specialized in the practice of orthodontics three years or longer. The Denver Summer Seminar is a nonprofit course conducted for practicing orthodontists.

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### Note of Interest

Dr. Varney E. Barnes and Dr. Richard E. Barnes announce the removal of their office to 838 Keith Bldg., Cleveland, Ohio.

## OFFICERS OF ORTHODONTIC SOCIETIES\*

### American Association of Orthodontists

*President*, Henry U. Barber, Jr. - - - - 5 East Fifty-Seventh St., New York, N. Y.  
*Secretary-Treasurer*, Max E. Ernst - - - 1250 Lowry Medical Arts Bldg., St. Paul, Minn.  
*Public Relations Bureau Director*, Dwight Anderson  
 - - - - - 292 Madison Ave., New York, N. Y.

### Central Association of Orthodontists

*President*, Harold J. Noyes - - - - - 55 E. Washington St., Chicago, Ill.  
*Secretary-Treasurer*, L. B. Higley - - - - - 705 Summit Ave., Iowa City, Iowa

### Great Lakes Society of Orthodontists

*President*, Frank S. Cartwright - - - - - Henry Ford Hospital, Detroit, Mich.  
*Secretary-Treasurer*, Richard E. Barnes - - - - - 838 Keith Bldg., Cleveland, Ohio

### Harvard Society of Orthodontists

*President*, I. D. Davis - - - - - 419 Boylston St., Boston, Mass.  
*Secretary-Treasurer*, Edward I. Silver - - - - - 80 Boylston St., Boston, Mass.

### New York Society of Orthodontists

*President*, Glenn F. Young - - - - - 745 Fifth Ave., New York, N. Y.  
*Secretary-Treasurer*, William C. Keller - - - - 40 E. Forty-Ninth St., New York, N. Y.

### Pacific Coast Society of Orthodontists

*President*, Ben L. Reese - - - - - Roosevelt Bldg., Los Angeles, Calif.  
*Secretary-Treasurer*, Earl F. Lussier - - - - - 450 Sutter St., San Francisco, Calif.

### Rocky Mountain Society of Orthodontists

*President*, A. B. Brusse - - - - - 1558 Humboldt St., Denver, Colo.  
*Secretary-Treasurer*, Robert L. Gray - - - - - Republic Bldg., Denver, Colo.

### Southern Society of Orthodontists

*President*, Fred G. Hale - - - - - Professional Bldg., Raleigh, N. C.  
*Secretary-Treasurer*, T. C. Sparks - - - - - 1508 Washington St., Columbia, S. C.

### Southwestern Society of Orthodontists

*President*, E. Forris Woodring - - - - - Medical Arts Bldg., Tulsa, Okla.  
*Secretary-Treasurer*, R. E. Olson - - - - - Union Nat'l Bank Bldg., Wichita, Kan.

### Washington-Baltimore Society of Orthodontists

*President*, Paul W. Hoffman - - - - - 1835 Eye St., N. W., Washington, D. C.  
*Secretary-Treasurer*, Stephen C. Hopkins - - - - 1726 Eye St., Washington, D. C.

### American Board of Orthodontics

*President*, Harry E. Kelsey - - - - - 833 Park Ave., Baltimore, Md.  
*Vice-President*, Frederic T. Murlless, Jr. - - - - 43 Farmington Ave., Hartford, Conn.  
*Secretary*, Charles R. Baker - - - - - 636 Church St., Evanston, Ill.  
*Treasurer*, Bernard G. DeVries - - - - - Medical Arts Bldg., Minneapolis, Minn.  
 William E. Flesher - - - - - 806 Medical Arts Bldg., Oklahoma City, Okla.  
 Oliver W. White - - - - - 213 David Whitney Bldg., Detroit, Mich.  
 James D. McCoy - - - - - 3839 Wilshire Blvd., Los Angeles, Calif.

### Foreign Societies†

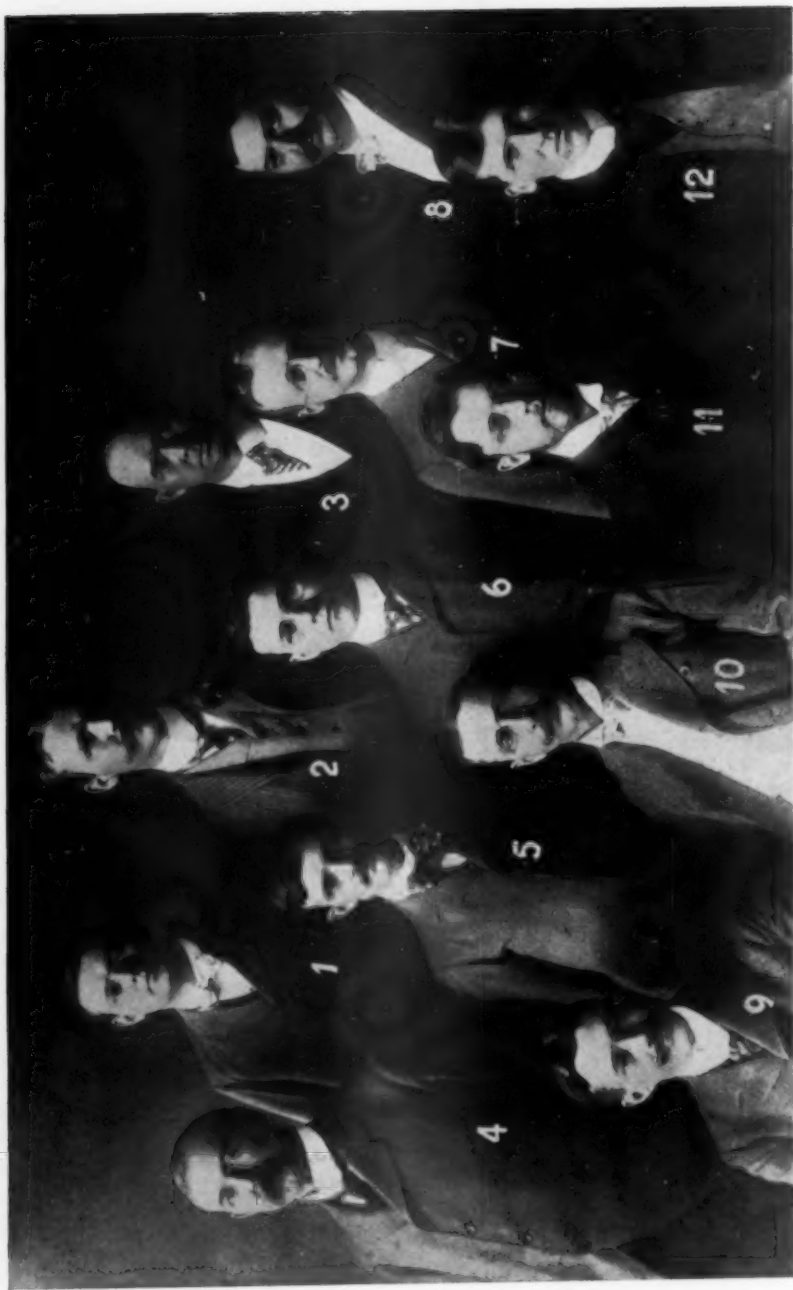
#### British Society for the Study of Orthodontics

*President*, S. A. Riddett  
*Secretary*, R. Cutler  
*Treasurer*, Harold Chapman

\*The Journal will make changes or additions to the above list when notified by the secretary-treasurer of the various societies. In the event societies desire more complete publication of the names of officers, this will be done upon receipt of the names from the secretary-treasurer.

†The Journal will publish the names of the president and secretary-treasurer of foreign orthodontic societies if the information is sent direct to the editor, 8022 Forsythe, St. Louis, Mo., U. S. A.





1900 Class of the Angle School of Orthodontia, St. Louis, Mo.  
 1, Frank A. Gough. 2, Thomas B. Mercer. 3, Charles B. Blackmar. 4, A. H. Thompson. 5, Fred C. Kemple.  
 6, Lloyd S. Lourie. 7, Grafton Munroe. 8, Richard Summa. 9, Herbert A. Pullen. 10, E. H. Angle. 11, M. T.  
 Watson. 12, F. W. Rafter. (Courtesy of Dr. B. W. Weinberger, New York, N. Y.)